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ABSTRACT

This paper focuses on two important dimensions of Indonesia's development record: education and health. The paper investigates the extent to which the poor benefit from public and private provisioning of these services. Multiple rounds of annual household surveys document a reversal in the rate of decline in poverty and a slowdown in improvements in the social sector as a result of the economic crisis in the late 1990s. Rural and urban analyses of public spending in education and health reveal patterns consistent with experience in other countries: spending on primary education and primary health care tends to be pro-poor, while spending on higher education and hospitals is less obviously beneficial to the poor. These conclusions are tempered once one allows for economies of scale in consumption, which weaken the link between poverty status and household size. An examination of the incidence of changes in government spending finds that the marginal incidence of spending in both junior and senior secondary schooling is more progressive than what static analysis would suggest, consistent with a process of "early capture" by the non-poor of education spending. In the case of health, marginal and average incidence analysis point to the same conclusion: the greatest benefit to the poor would come from an increase in primary health care spending. A table presents data for rural and urban areas of each province on poverty, adult illiteracy, elementary school dropouts, infant mortality, and child malnutrition. Appendices present additional data tables and notes. (Contains 45 references.) (Author/TD)

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Poverty, Education and Health in Indonesia: Who Benefits from Public Spending?

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December 2001

Abstract

This paper focuses on two important dimensions of Indonesia's development record: education and health. The paper investigates the extent to which the poor benefit from public and private provisioning of these services. Drawing on multiple rounds of SUSENAS household surveys we document a reversal in the rate of decline in poverty and slowdown in improvements in the social sectors as a result of the economic crisis in the second half of the 1990s. We carry out traditional static benefit-incidence analysis of public spending in education and health, and find patterns which are consistent with experience in other countries: spending on primary education and primary health care tends to be pro-poor, while spending on higher education and hospitals is less obviously beneficial to the poor. These conclusions are tempered once one allows for economies of scale in consumption, and thereby weaken the link between poverty status and household size. We then examine the incidence of *changes* in government spending. We find that the marginal incidence of spending in both junior and senior secondary schooling is more progressive than what static analysis would suggest, consistent with a process of "early capture" by the non-poor of education spending. In the case of health, marginal and average incidence analysis point to the same conclusion: the greatest benefit to the poor would come from an increase in primary health care spending.

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J. Feather

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1. Introduction

Indonesia has long featured prominently in debates on economic development. This is in part due to size; Indonesia's large population (207 million) ranks it among the five most populous in the world and the vast span of the archipelago makes it among the largest in geographic terms as well. However, from a development perspective Indonesia has been particularly remarkable because of the great progress it has made, since independence, in raising average incomes and human development outcomes and in reducing poverty. Then, in 1997/98 Indonesia, along with other East Asian "tigers", was hit by a series of monetary shocks. All of a sudden economic crisis and political instability came to pose real threats to the sustainability of its development course and have even raised the specter of collapse.

This paper focuses on two important dimensions of Indonesia's development record: education and health. We assess to what extent all segments of Indonesian society have shared in the expansion of educational achievements and the improvement in health outcomes. In particular, we investigate the extent to which the poor (defined in terms of low consumption levels) benefit from public and private provisioning of these essential services.

The analysis draws, for a large part, on the Susenas household surveys. These large household surveys have nationwide coverage and are fielded on a yearly basis. Each year, a Core questionnaire is administered to a large sample of households (the 1998 survey covers 880,040 individuals). This questionnaire collects basic social indicators and also has a short consumption questionnaire. About a third of the sample also receives a Module questionnaire. There are three Modules, which rotate every year. In 1995 and 1998 the health and education Module were administered. These Modules collect detailed information on household health and education expend itures as well as inpatient treatment. The analysis in this paper draws mainly on the data from the Core questionnaires from 1995 through 1998 as well as the health and education modules of 1995 and 1998.

The plan of the paper is as follows. We start the next section with a brief description of poverty in Indonesia, and an overview of education and health outcomes in Indonesia.. This assessment of progress to date sets the scene for the subsequent analysis. The poverty lines underpinning the poverty measures in this section also allow us to construct two alternative regional price indices. We describe in this section how dimensions of well-being beyond simply a money-metric measure of consumption have informed our final selection of a regional price index. All subsequent analysis in this paper is based on a consumption measure of well-being deflated by this price index.

Following our review of economic and human development outcomes in Indonesia, we turn in Section 3 to the interaction between incomes, education and health. Education and health have not only an important intrinsic value to people – contributing directly to the quality and duration of their daily lives – but also help to determine income levels, which in turn provide further means to raise living standards. Moreover, there may be additional indirect linkages, such as the contribution of education to health outcomes, etc. We draw on recent research to provide empirical background to recent debates on the interaction of poverty, education and health outcomes in Indonesia.

Having considered the importance to social welfare of a well-educated and healthy population, we consider in Section 4 why the government might feel compelled to intervene in the social sectors to subsidize education and health prices. We review the empirical literature on the price elasticity of demand for education and health in Indonesia, and show that without government intervention to keep prices low, the poor in particular are unlikely to achieve the education and health outcomes which are considered socially desirable.

We follow, in Section 5, with a brief description of education and health provision in Indonesia, and illustrate that, indeed, the public sector has been the dominant actor in this domain.

Section 6 presents the main results of the analysis. We produce a basic benefit-incidence analysis of education and health spending in Indonesia aimed at determining to what extent government spending in education and health has actually benefited the poor. We distinguish between three types of education services and two health services. For all services we distinguish between private and public facilities. In education, we analyze the benefit incidence of primary education, junior secondary and senior secondary schools. In health we distinguish between primary health care and hospitals.[ii] We subject our results to robustness tests according to alternative assumptions about economies of scale in household consumption. This latter issue is receiving increased attention in the academic literature, the growing concern being that the implicit assumption of no economies of scale, underpinning traditional incidence analysis, could lead to dangerously misleading conclusions.

We then document both government as well as private spending across income groups. The utilization of public facilities is contrasted with the utilization of private facilities offering the same type of services. We note that households incur expenses irrespective of whether they consume services from public or private providers. We examine the distribution of private outlays across quintiles and compare this to the value of transfers received.

Moving beyond the classic benefit incidence analysis, we probe an important concern regarding the interpretation of results from standard analysis. Does the average incidence of public spending on education and health provide a reliable indicator of the incidence of a *change* in public spending? We scrutinize the impact of public spending over time, by comparing the incidence in the 1990s with the incidence in the 1970s and 1980s. We also employ a recently proposed econometric approach to estimate the marginal incidence of public spending and compare the results from this analysis to those from the standard approach.

Finally, in Section 7, we sum up the findings from the analysis and presents some policy recommendations.

2. Poverty, Education and Health Outcomes in Indonesia

In this section we provide an overview of poverty education and health in Indonesia. We do so by reviewing long term and recent changes in poverty (section 2.1), health (section 2.2)

and education (section 2.3) outcomes. Indonesia is a large country and the national patterns do not necessarily hold for each region. For this reason we pay explicit attention to regional patterns in our discussion.

2.1 Poverty

Trends in National Poverty

Until the onset of the East Asian financial crisis, Indonesia experienced strong declines in poverty. Official statistics report the percentage of the population living in poverty dropping steadily from 40.1 in 1976, to 28.6 in 1980, to 17.4 in 1987, to 15.1 in 1990, to 13.7 in 1993 to 11.3 in 1996[iii]. The financial crisis, which started in 1997, left its mark on poverty. Because poverty statistics are only collected every three years, it is not yet possible to say with great precision what has been the effect of the crisis. However, a comparison of the 1996 and 1999 data indicates that poverty increased by about 8 percentage points (Suryahadi, Sumarto, Suharso and Pritchett, 1999) between these two years. The actual effect of the crisis may well have been larger because poverty is likely to have continued declining between 1996 and 1997, when the economy was still in good shape. Using a series of different surveys fielded between 1996 and 1999, Suryahadi et al try to trace the evolution of poverty over the course of the crisis. Their findings are summarized in Figure 1. From 1996 to October of 1997, when the financial crisis hit, poverty fell by 3.1 percent point. From that point in time, poverty increased by about 11 percentage points within one year. There is little evidence of a consistent trend beyond August, 1998; the current picture remains quite unclear.

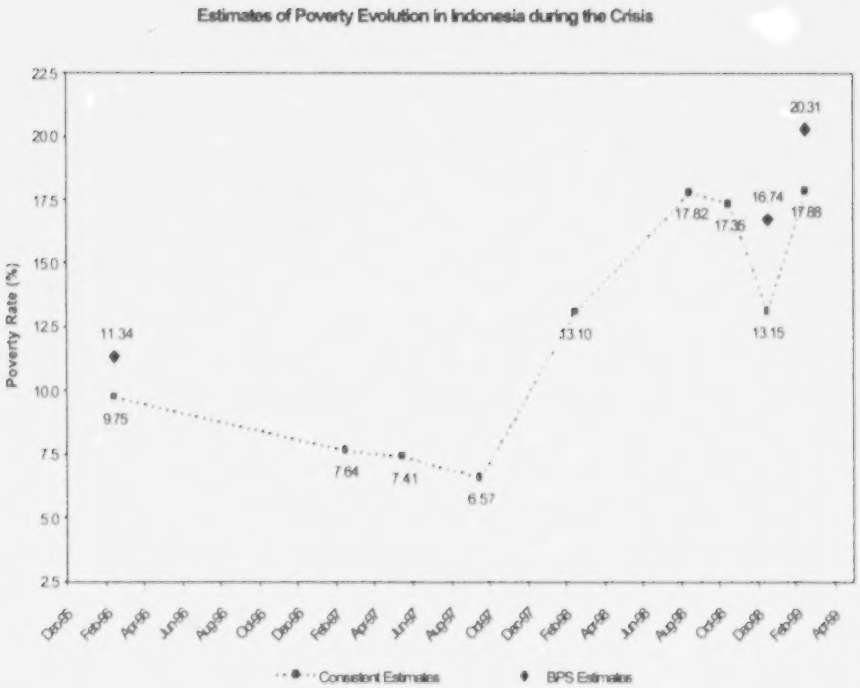

Figure 1 Evolution of poverty over the course of the crisis (source Suryadi et all, 1999)

Measurement Issues

Official poverty statistics are based on regionally deflated per capita consumption measures collected through a detailed consumption module. In this study we use the same basic indicator of welfare but at times probe the sensitivity of results to variations in some of the assumptions it embodies. Two issues warrant particular attention. The first is the choice of the regional price deflator. We describe below how we deflate our consumption measures to take into account spatial price variation. A second issue is that the per capita consumption measures rule out economies of scale within the household. We will test the sensitivity of the results with respect to this assumption in the Section 6.

There is considerable controversy in Indonesia regarding the choice of poverty lines (see Chesher, 1998). The Government of Indonesia maintains a set of poverty lines (two poverty lines are calculated for each province, one urban and one rural). These poverty lines are intended to represent the expenditure needed to meet a daily nutritional requirement of 2100 calories per person per day plus an allowance for non-food. Applying these lines to the consumption measure collected in the 1996 SUSENAS (the most recent year for which detailed consumption figures are available) shows that 11 percent of the population can be considered poor. Independently, the World Bank constructed a second set of poverty lines

using the cost of basic needs method (Ravallion and Bidani, 1994) for 1990.[iv] This set of poverty lines (referred to as the "alternative" poverty lines), when updated to 1996 price levels, shows 7 percent of the population living in poverty. The two methods yield different estimates with respect not only to the overall level of poverty, but also yield markedly different regional poverty profiles. In particular, the "alternative" poverty lines indicate larger disparities in poverty between urban and rural areas than the official method.

The two sets of poverty lines described above are intended to capture the differential in the cost of reaching a given standard of living across Indonesia's provinces (and urban/rural sectors). It is possible to use these poverty lines to construct respectively, two sets of regional price indices. If we then deflate nominal per capita consumption in each province/sector using a given price index, we obtain a measure of "real" per capita consumption. It is straightforward to show that if we measure poverty in terms of real consumption and a single, national poverty line (the population weighted average of the province/sector-specific poverty lines) we obtain the same poverty rates as were reported above based on nominal consumption and a regional set of poverty lines.[v] As mentioned above, the attraction of constructing a measure of real consumption is that we then obtain the comparability across households needed to undertake the benefit incidence analysis.

Figure 2 shows the distribution function of per capita consumption and various poverty lines. Three distribution functions are given. The first is in nominal terms, the second is in real terms using the official poverty lines as price deflators and the third is in real terms using the "alternative" poverty lines as price deflators. Both the "official" and "alternative" national poverty lines are considerably below the international standard of 2 US dollars a day (in 1985 prices), a poverty line that is often used for international poverty comparisons. According to the *World Development Indicators* (World Bank, 1999) 50.4 percent of the population of Indonesia lived below the $2 a day poverty line.

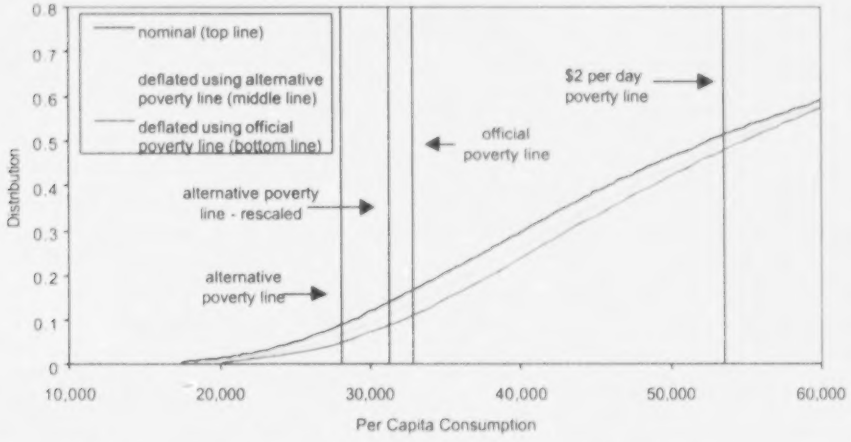

Figure 2 Distribution function of per capita consumption and poverty lines in 1996

Choosing a price index

Which of the two "real" consumption vectors (one based on the official poverty lines and the other based on the "alternative" poverty lines) should be used in the subsequent analysis? It is not immediately obvious which set of poverty lines is preferable to use as regional price deflators. To resolve the issue for this study, we start by recognizing that poverty is a multi-dimensional phenomenon. Other factors in life, such as education or a clean environment, also directly influence individual welfare. To decide between our two price deflators, we choose the one which yields a regional poverty profile that best mirrors regional patterns of well-being resulting from a set of other, non-monetary, indicators of welfare. The indicators we use are (1) self-reported illiteracy of the population aged 15 and above, (2) fraction of children aged 15 to 17 that did not complete primary school, (3) child mortality[vi] and (4) the percent of children under 5 that are malnourished.[vii] We rescaled the "alternative" poverty lines by a constant such that they yield the same poverty head count as the official poverty lines on a national level. The results by region are shown in Table 1. The Spearman's rank correlations are shown in Table 2. We find that the profile based on the "alternative" set of poverty lines shows a consistently higher degree of correlation with the non-monetary indicators of welfare than the official poverty lines. We therefore opt for the "alternative" set of poverty lines as regional price deflators in the remainder of this study. The resulting real per capita consumption is the basis on which we will calculate consumption quintiles.

Table 1 Headcount Rates and other indicators of welfare by region in 1996

Province	Area	Perc. Poor using official poverty lines	Perc. Poor using alternative rescaled poverty lines	Adult illiteracy (%)	children aged 15-17 that did not complete primary school (%)	Infant mortality	Children mal-nourished (%)
Aceh	Urban	7.2	5.4	3.38	4.1	43	46
	Rural	11.1	8.2	11.74	9.0	49	48
North Sumatra	Urban	9.5	3.8	2.19	4.1	57	43
	Rural	11.7	8.2	7.93	10.9	53	38
West Sumatra	Urban	5.3	2.1	3.07	5.2	43	29
	Rural	9.9	4.6	10.11	12.3	79	30
Riau	Urban	4.4	4.4	4.29	3.5	0	27
	Rural	9.5	12.8	7.92	12.6	49	38
Jambi	Urban	7.5	2.2	3.71	3.2	37	28
	Rural	9.2	4.7	10.05	13.4	58	35
South Sumatra	Urban	12.2	0.9	4.68	5.1	41	25
	Rural	10.6	12.7	11.96	21.4	63	31
Bengkulu	Urban	6.1	6.1	2.31	5.0	46	20
	Rural	10.4	19.3	10.80	17.9	72	26
Lampung	Urban	9.2	7.5	5.03	5.7	54	20
	Rural	11.1	24.2	11.33	9.8	63	35
Jakarta	Urban	2.5	1.4	3.19	2.9	34	22
West Java	Urban	10.1	4.6	6.05	5.1	47	24
	Rural	9.3	8.2	13.79	12.1	75	28
Central Java	Urban	13.9	3.0	12.11	4.8	44	27
	Rural	14.1	14.0	22.04	7.4	49	29
Yogyakarta	Urban	12.1	5.7	13.53	2.9	0	25
	Rural	7.4	8.5	27.06	6.1	38	33
East Java	Urban	13.3	11.0	10.24	3.8	42	27
	Rural	11.1	17.8	28.28	11.2	65	30
Bali	Urban	5.4	4.4	11.59	3.7	39	20
	Rural	3.7	4.0	25.56	11.2	47	21
West Nusa Tengara	Urban	19.7	15.4	18.57	14.1	80	37
	Rural	17.1	16.5	35.41	19.7	113	39
East Nusa Tengara	Urban	14.3	15.7	5.48	5.8	37	43
	Rural	19.6	34.4	23.85	26.3	67	37
East Timor	Urban	15.1	5.7	17.15	11.0	48	24
	Rural	33.1	32.8	57.87	44.8	84	38
West Kalimantan	Urban	11.7	4.6	11.74	7.3	51	24
	Rural	23.6	29.3	22.02	23.5	69	44
Central Kalimantan	Urban	6.8	2.8	2.80	6.1	39	33
	Rural	13.0	8.9	7.51	14.1	48	33
South Kalimantan	Urban	10.7	1.0	5.09	7.4	55	28
	Rural	13.7	4.7	11.84	17.3	93	34

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Table 1- continued from previous page

Province	area	Perc. Poor using official poverty lines	Perc. Poor using alternative rescaled poverty lines	Adult illiteracy (%)	children aged 15-17 that did not complete primary school (%)	infant mortality	children mal-nourished (%)
East Kalimantan	Urban	5.3	0.6	5.66	6.0	43	22
	Rural	12.2	15.6	14.04	11.2	70	31
North Sulawesi	Urban	6.5	4.9	1.76	9.3	42	30
	Rural	12.5	31.2	3.77	17.8	42	36
Central Sulawesi	Urban	5.1	3.0	4.67	6.9	58	27
	Rural	9.3	13.2	11.06	13.3	84	39
South Sulawesi	Urban	11.5	7.0	9.17	8.9	48	30
	Rural	6.6	14.5	25.26	19.6	66	32
South East Sulawesi	Urban	7.1	12.0	7.05	7.8	46	26
	Rural	8.4	21.3	15.87	16.5	65	28
Maluku	Urban	6.4	4.2	1.24	2.8	34	29
	Rural	24.7	26.9	8.93	11.1	56	22
Irian Jaya	Urban	9.5	6.0	3.59	4.7	53	29
	Rural	23.7	53.9	44.13	35.4	53	28
Indonesia	Urban	9.8	5.0	7.12	4.8	39	27
	Rural	12.0	14.8	19.23	13.1	65	32
		11.1	11.1	14.66	9.8	57	30
Nr. of observations		264,786	264,786	588,689	60,219		82,150

Source: Poverty estimates, literacy, primary school completion and infant mortality based on author's calculations using 1996 Susenas. Malnutrition data are copied from based on results from Saadah, Waters, and Heywood (1999) who use the 1998 Susenas.

Table 2 Spearman's rank correlation between poverty indices and other welfare measures

	Adult illiteracy (%)	Children aged 15-17 that did not complete primary school (%)	infant mortality	children mal-nourished (%)
Perc. Poor using official poverty lines	0.514	0.460	0.398	0.315
Perc. Poor using alternative poverty lines	0.569	0.683	0.491	0.405

Note: Calculations based on regional poverty indices presented in table 1.

Regional Poverty

Table 3 reproduces the regional poverty profile reported in Table 1, based on our preferred consumption measure, and on the basis of the headcount measure plus two additional poverty measures: the poverty gap (or FGT1) ; and the squared poverty gap (FGT2).[viii] These two poverty measures differ from the headcount (or FGT0) in that they take into account the distance of poor individuals from the poverty line. Thus they take into account the varying "depth" of poverty of different individuals. The FGT2 measure is more sensitive to those who are very far from the poverty line than the FGT1 measure. It is clear that comparisons of poverty, across, say, regions, need not be the same across different measures. Indeed, as Table 3 indicates, while all three poverty measures clearly identify rural Irian Jaya as the poorest region in the country, the two distributionally sensitive poverty measures find the next poorest region to be rural East Timor, while the headcount measure finds it to be rural East Nusa Tengara. In general, and as mentioned above, the regional poverty profile based on our preferred regional price deflators (the alternative set of poverty lines) tends to find much higher rural than urban poverty. If anything this is even more strongly the case with non-monetary indicators of wellbeing (see Table 1).

Table 3 FGT Measures of Poverty, 1996.

Province	Area	Headcount	Poverty gap	FGT 2
Aceh	Urban	0.05	0.0081	0.0019
	Rural	0.08	0.0109	0.0023
North Sumatra	Urban	0.04	0.0050	0.0011
	Rural	0.08	0.0119	0.0029
West Sumatra	Urban	0.02	0.0023	0.0004
	Rural	0.05	0.0059	0.0013
Riau	Urban	0.04	0.0063	0.0016
	Rural	0.13	0.0199	0.0051
Jambi	Urban	0.02	0.0026	0.0005
	Rural	0.05	0.0092	0.0027
South Sumatra	Urban	0.01	0.0008	0.0001
	Rural	0.13	0.0166	0.0036
Bengkulu	Urban	0.06	0.0093	0.0021
	Rural	0.19	0.0382	0.0113
Lampung	Urban	0.08	0.0113	0.0024
	Rural	0.24	0.0413	0.0108
Jakarta	Urban	0.01	0.0019	0.0004
West Java	Urban	0.05	0.0072	0.0017
	Rural	0.08	0.0104	0.0020
Central Java	Urban	0.03	0.0045	0.0012
	Rural	0.14	0.0222	0.0054
Yogyakarta	Urban	0.06	0.0068	0.0014
	Rural	0.09	0.0133	0.0033
East Java	Urban	0.11	0.0153	0.0034
	Rural	0.18	0.0279	0.0068
Bali	Urban	0.04	0.0048	0.0009
	Rural	0.04	0.0059	0.0012
West Nusa Tengara	Urban	0.15	0.0211	0.0047
	Rural	0.17	0.0245	0.0055
East Nusa Tengara	Urban	0.16	0.0268	0.0069
	Rural	0.34	0.0660	0.0193
East Timor	Urban	0.06	0.0088	0.0018
	Rural	0.33	0.0700	0.0210
West Kalimantan	Urban	0.05	0.0059	0.0013
	Rural	0.29	0.0476	0.0110
Central Kalimantan	Urban	0.03	0.0053	0.0015
	Rural	0.09	0.0111	0.0021
South K alimantan	Urban	0.01	0.0014	0.0003
	Rural	0.05	0.0050	0.0009
East Kalimantan	Urban	0.01	0.0008	0.0001
	Rural	0.16	0.0269	0.0074

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Table 3 – continued from previous page

Province	Area	Headcount	Poverty gap	FGT 2
North Sulawesi	Urban	0.05	0.0078	0.0017
	Rural	0.31	0.0677	0.0216
Central Sulawesi	Urban	0.03	0.0042	0.0009
	Rural	0.13	0.0205	0.0048
South Sulawesi	Urban	0.07	0.0098	0.0022
	Rural	0.14	0.0241	0.0059
South East Sulawesi	Urban	0.12	0.0342	0.0149
	Rural	0.21	0.0352	0.0088
Maluku	Urban	0.04	0.0058	0.0010
	Rural	0.27	0.0502	0.0143
Irian Jaya	Urban	0.06	0.0081	0.0014
	Rural	0.54	0.1520	0.0580
Indonesia	Urban	0.05	0.0072	0.0017
	Rural	0.15	0.0243	0.0063
		0.11	0.0179	0.0046
Nr. of observations		264,786	264,786	264,786

Source: Author's calculations based on 1996 Susenas household survey

2.2 Education

National Trends

Indonesia has achieved remarkable increases in enrollment over the past decades., Figure 3 shows the gross enrollment rate by school type from 1971 to 1997. Universal primary school enrollment was reached around 1986. Since the extension of the mandatory school going age up to 15 years, enrolment in junior secondary has been increasing steadily but is not yet universal. In 1997, gross enrollment in junior secondary was 72.2 percent while gross enrollment in senior secondary stood at 46.5 percent (BPS 1997).

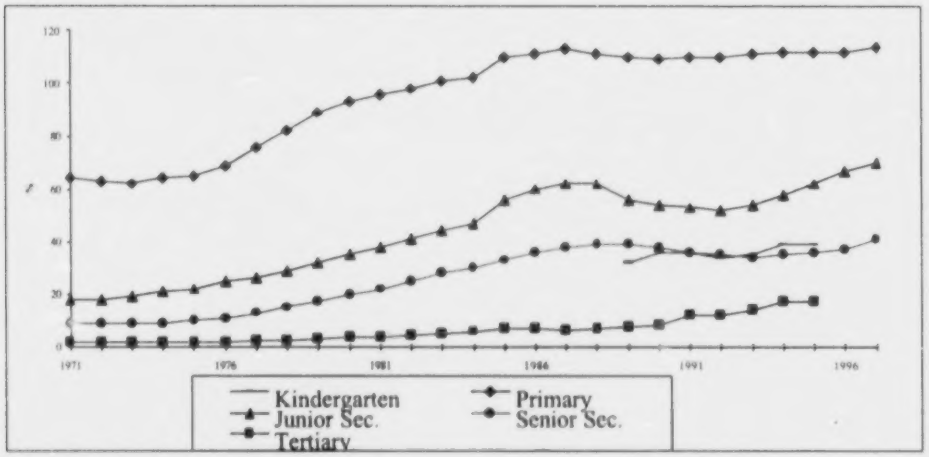

Figure 3 Gross enrolment rates from 1971 to 1997 by school level

The effects the financial crisis on enrollment at the national level seem to have been limited. Table 4 presents enrollment rates from 1995 to 1999. From 1997 to 1998, a small decrease in enrollment was recorded (Pradhan and Sparrow, 2000). In the next year, all losses in enrollment were recovered. At the senior secondary level, enrollment has continued to rise steadily over the course of the crisis. There is, however, evidence of delayed enrollment as a result of the crisis. The average age of children by school type was decreasing up to 1997 and since then has risen continuously. The average age of children in primary school dropped from 9.75 to 9.59 from 1995 to 1997 and since then steadily increased to 9.60 in 1998 and to 9.61 in 1999. A similar trend can be observed for the transition from junior to senior secondary school. The average age of junior secondary students moved from 14.23 in 1995, to 14.18 in 1997, to 14.21 in 1998 to 14.27 in 1999. Evidence from a school survey (Filmer and others, 1999) confirms the delayed enrolment in basic education. The school survey also indicates that in some regions the effects of the crisis on enrollment have been severe. Enrolment for boys in primary school in the poor areas of Jakarta fell by 8 percent. At the junior secondary level, Jakarta, urban Central Java, and urban Maluku saw large enrollment declines (8.6%, 5.7%, and 5.8%, respectively); while rural South Sulawesi saw an 8.1% increase (a fact which may be associated with the cash crop nature of its economy). This is not always confirmed when we look at the Susenas data. For instance, the gross enrollment at the junior secondary level in urban Central Java dropped only from 87.9 to 87.4 from 1997 to 1998 according to the Susenas. One possible explanation for the discrepancy is that schools record absenteeism as dropouts while households record an absent child as still being enrolled. According to the Susenas, the percentage of children enrolled in school who indicate that their main activity is going to school decreased by 2.8 percent point for children in primary school, by 2.4 percent point for those in junior secondary and by 2.3 percent point for those in senior secondary from 1197 to 1998. The drops were larger in the rural areas – around 3 percent for all school types. In 1999, enrolled children reported to go to school more frequently, although the pre-crisis level has not been retained.

Table 4 Gross en net enrollment in primary, junior secondary and senior secondary level in 1995,1997, 1998 and 1999

	1995	1997	1998	1999
Gross enrollment				
Primary	107.0	108.0	107.6	108.0
junior secondary	65.7	74.2	73.4	76.1
senior secondary	42.4	46.6	47.4	48.4
Net enrollment				
Primary	91.5	92.3	92.1	92.6
junior secondary	51.0	57.8	57.1	59.2
senior secondary	32.6	36.6	37.5	38.5

Source: Author's calculations based on Susenas household surveys

Regional Patterns

As mentioned above, Indonesia is a diverse country and many of the larger islands could be considered a country by themselves if one considers their size and population. For this reason it is important to explore geographic variation in education indicators. Table 1 presents outcome indicators for poverty, education and health, in turn. The first 8 provinces in this Table represent Sumatra, moving from north to south. Adult literacy rates are notably low in North Sumatra. The southern provinces on this island face real problems with school enrollment in the rural areas. Around 20 percent of the children aged 15-17 in Bengkulu and South Sumatra are not enrolled in school.

Java is the most populous island in Indonesia, with about half of Indonesia's total population. Although Central Java is the poorest province on the island in terms of the head count ratio, this does not show up in the other social indicators. Adult illiteracy is a large problem in the eastern provinces in the rural areas. About a quarter of the adult population reports to be illiterate, higher than in any province in Sumatra (and compared to a national illiteracy rate of 15 percent). School enrollment is relatively high throughout Java. Only in rural West Java and East Java the percent of children aged 15-17 not enrolled in school exceeds 10 percent.

Bali, although technically belonging to the eastern provinces, resembles Java fairly closely. Poverty is low, and the other indicators are comparable in magnitude to those found in Java. The other eastern provinces, however, comprising West Nusa Tengara, East Nusa Tengara and East Timor, scoring badly on all indicators. Poverty is over 15 percent in both urban and rural areas according to the official poverty lines. In rural East-Timor it stands at over 30 percent. Illiteracy is high in rural West Nusa Tengara and E-Timor. Children drop out of school at an early age, especially in the rural areas ofEast Timor and East Nusa Tengara.

Kalimantan shows very high disparities among urban and rural areas, especially in West Kalimantan. Poverty in rural W-Kalimantan is more than twice that of urban West-Kalimantan, even using the official poverty measures. Illiteracy rates, and also enrollment rates, are substantially higher in rural areas.

In North and Central Sulawesi, the patterns are broadly similar to those observed elsewhere. South Sulawesi shows high (25%) adult illiteracy in rural areas. Remarkably, the official poverty indicators rank urban South Sulawesi above rural South Sulawesi. This is not confirmed in any of the other social indicators. Maluku records high rural poverty rates - 25 percent using the official poverty line – but otherwise scores above the national average on educational outcomes. Rural Irian Jaya scores particularly badly on the poverty and education indicators.

An important observation with respect to regional patterns of poverty and education is that while considerable heterogeneity is observed this variation does not occur only *between* islands, or between say, Java and the rest of the country, but is also observed within the major islands. For example, while much of Java does relatively well (compared to national averages) in terms of the incidence of poverty, East Java does quite badly. Similarly, while West Kalimantan does quite badly in terms of poverty and education outcomes (and also health outcomes, see below), the situation is far less worrisome in Central Kalimantan. Heterogeneity, observed *within* regions, probably indicates that the more simplistic explanations for the distribution of welfare outcomes, in terms of government capture by a single constituency from a specific locality, may be of only limited validity in the Indonesian context.

Health

National Trends

Health indicators have been improving steadily during recent decades. Figure 4 shows trends in child mortality and life expectancy. Infant mortality dropped from 118 in 1970 to 49 at present. Life expectancy at birth rose from 48 to 65 years over the same period. Despite these impressive achievements, Indonesia's indicators still lag behind those of its neighbors. For example, life expectancy at birth in Malaysia stands at 72, 66 in the Philippines and 70 Thailand. The figures on child mortality tell a similar story. Infant mortality in 1996 was 11.4 in Malaysia, 37 in the Philippines and 34 in Thailand.

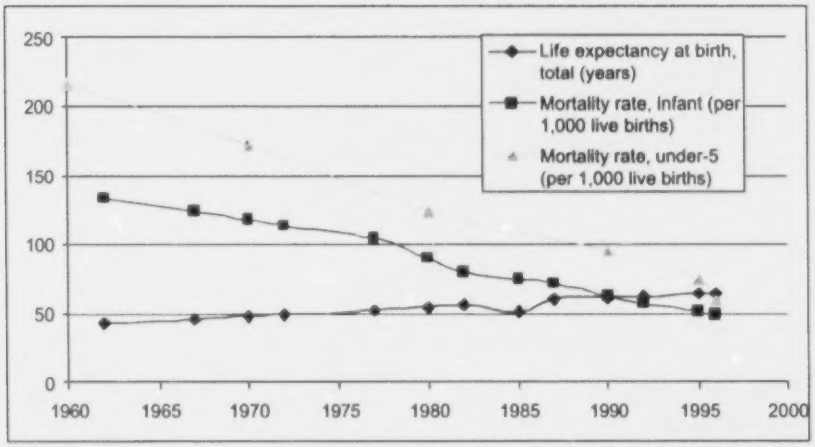

Figure 4 Trends in health outcomes (Source: World Development Indicators, World Bank 1998)

Survey data indicate that the recent economic crisis has had negative effects on self-reported morbidity(Pradhan and Sparrow 2000). The SUSENAS household surveys document a reversal in the positive trend observed from 1995 to 1997 (Figure 5). Self-reported morbidity (percent of population which self-reported illness in the past month) dropped from 25.4 percent in 1995 to 24.4 percent in 1997 but then rose again to 25.5 percent in 1998. From 1998 to 1999, morbidity fell back to 24.6 percent. Figure 5 shows the patterns in age specific morbidity. The national pattern as described above is found for all adults. For children, reported morbidity has increased continuously from 1995 to 1999. This does not necessarily imply that children's health status has worsened over time. Another possible explanation is that parent's have become more aware of children's illnesses and therefore report them as sick more frequently. Nutritional indicators of children under age 5 do *not* show any worsening over the course of the crisis (Saadah, Pradhan, Surbakti, 1999). Malnutrition, as measured by weight for age, is a sensitive measure for short-term changes in nutritional status. From 1998 to 1999, malnutrition dropped from 29.8 percent to 28.5 percent. Malnutrition continued to improve in spite of the economic crisis. In the urban areas, where the crisis hit the hardest, the drop in the malnutrition rate was higher (1.7 percent point) than in the rural areas (1.4 percent point). Boys saw greater improvements in their nutritional status (2.5 percent point drop) than girls (0.2 percent point drop), although in 1999 the malnutrition rate among girls (26.7 percent) was still lower than that of boys (30.1 percent).

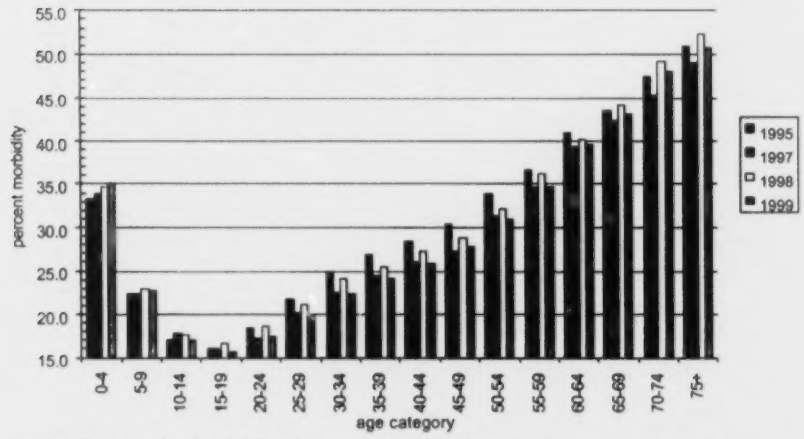

Figure 5 Changes in morbidity by age category (percent)

A clear effect of the crisis is found in utilization patterns. Figure 6 shows the evolution of utilization rates by provider over time. Utilization rates (percent of population visiting provider during last month) for modern medical facilities dropped from 12.8 in 1997 to 10.5 in 1998, with most of the fall due to a drop in the use of public services (Saadah, Pradhan, Surbakti, 1999). The drop in utilization rates is also recorded in the IFLS surveys (Frankenberg et al 1999).. The shift away from the public sector may in part be due to a deterioration of quality of public sector services resulting from a drop in real government health care expenditures. Real per capita government health care expenditures fell by 9 percent in fiscal year 1997/1998 and by 13 percent in fiscal 1998/1999 (Saadah, Lieberman, Juwono, 1999). 1999 saw a partial recovery of utilization rates in the public sector. A likely explanation for the recovery is the start of the social safety net program. This large-scale program included a health card, distributed to the poor, which entitled the owner to free health care in public services.

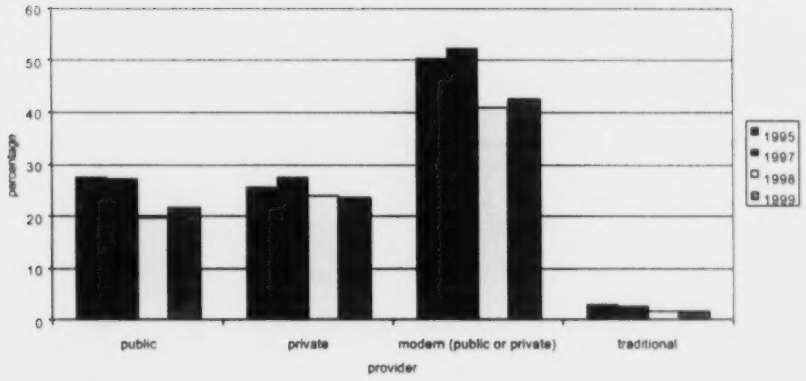

Figure 6: Proportion of ill people that consulted a health care provider, on an outpatient basis, in 1995 and 1998, by type of provider (percent)

Regional Patterns

On the whole, health outcomes across Indonesia's provinces track education outcomes fairly closely. Once again, the impression is of considerable geographic variation. While Indonesia as a whole has fairly encouraging education and health indicators, this hides the fact that there exist pockets of considerable hardship.

In Sumatra, the provinces face high infant mortality, but surprisingly, not so much malnutrition (measured in terms of weight for height for children under 5). Malnutrition is a significant problem in Aceh, the most northern province. Almost 50 percent of the children in this province are malnourished. In rural West Java infant mortality is also quite high – 75 per 1000 live births. The malnutrition indicators are very similar across Java, with children in rural areas facing a slightly higher probability of being malnourished.

Within the Eastern provinces, rural West Nusa Tengara is the only region in all of Indonesia with an infant mortality rate over 100. In these provinces, around 38 percent of the children in rural areas are malnourished. In Kalimantan, ,malnourishment is also quite high. Particularly striking is the high – 93 per 1000 births – infant mortality rate recorded in rural South Kalimantan. A similarly high infant mortality rate (84 per 1000) is observed in rural Central Sulawesi. In this region, other health indicators are similar to the national averages.

3. Links Between Poverty, Education and Health

Why do governments care about education and health outcomes? Improvement of education and health outcomes is sought because of their *intrinsic* value in raising capabilities and individual freedoms. They also have an *instrumental* value in contributing to higher incomes, and in reinforcing each other.[ix]

The main asset of the poor is their labor. Education and health are critical to preserving and enhancing the quality of this asset, and for this reason investment in health and education is especially important for the poor. The 1990 World Development Report (1990), as well as the forthcoming World Development 2000/1, conclude that investments in basic health and education are an important element of a poverty reduction strategy. In this section we review the empirical evidence for this claim for Indonesia. Increasingly it is recognized that health and education investments are choice variables and cannot be treated as exogenous. Recent articles dealt with this problem explicitly when estimating returns to education and health for Indonesia.

A common theme in the literature is that health and education not only benefit those who receive it. They also carry external effects in the sense that person living near to the ones who received the investment may benefit. Improved education of mothers may carry second-generation effects through healthier or better-educated children. Improved health will decease the risk for infectious diseases for those who live in the neighborhood. Again, we review the empirical evidence for Indonesia.

Economic returns to education and health

The classical way of getting to returns to education is by estimating a Mincerian earnings function. Private rate of returns estimated in this way are typically in the order of 12 percent (Psacharopoulos, 1994) and are the highest for primary education and females. Using 1981 data for urban Java, Byron and Takahashi (1989) find a 17 percent rate of return, much higher than found is most other countries. Social rate of return calculations take into account, in addition, the foregone earnings and the resources costs associated with providing education. McMahon and Boediono (1992) find high social rates of returns to investments in junior secondary education. Using wage data from 1982 to 1989, the social rate of return for junior secondary school is estimated at 14 percent and for senior secondary at 11 percent. They also estimate that agricultural out put can increase by 10 percent if farmers completed 9 instead of 5 years of education.

Bedi and Garg (2000) examine the effectiveness of public versus private secondary schools in Indonesia using the 1993 Family Life Survey. They find, after correcting for selectivity using a selection model and contrary to the conventional wisdom, that private schools are more efficient. The reason for the discrepancy is that their results indicate a clear negative selection effect into private schools, meaning that the students in private schools start at a lower level than those who start in public schools. Even though the average earnings of a public school graduate is higher than that of a private school graduate, the value added of the private schools turns out to be higher. Public school graduates earn on average 31 percent more than those who attended private Islamic or private non-religious school, and earn 14 percent less than those who attended a private Christian school. Correcting for the selection effect, the advantage of the public schools versus the Islamic schools is wiped out and replaced into a 75 percent disadvantage. The advantage of public schools over private non-religious schools increases to 47 while the public versus Christian private school earnings disadvantage drops to 5 percent. The results are based on a multinomial logit school selection model which is estimated simultaneously with earning equations. Time constant and reflective information is used to model the school selection decision the respondents faced in their youth. Regional

dummies, which indicate the province the respondent grew up, are used to achieve identification. Regional dummies reflecting the current residence enter into the earning equations. The model is thus identified by virtue of migration - 21 percent of the individuals moved between provinces after completing their education – which is treated as exogenous. A drawback of the model, which applies to all selection models, is that it is very difficult to estimate the constant term in the earnings equations in these models (Heckman 1990, Andrews and Schafgans 1998). Non parametric identification of the constant term requires a non-zero fraction of the population having a probability close to one of being selected into a particular school type. In a standard selection model, the contant term is indentified as a result of the chosen functional form of the model. The estimates of the constant terms influence the conclusions to a great extent and are likely to be sensitive to the chosen functional form (Pradhan and van Soest 1995).

Duflo (forthcoming) estimates the rates of return to primary education recognizing that the investment decision may be endogenous and carefully corrects for it using a natural experiment. She corrects for the endogeneity of schooling by exploiting regional and intertemporal variations in the Indonesian investment program for primary schools (SD INPRES), which was launched in 1973. The program was targeted to reach first those areas with the worst educational outcomes. As a result, the baseline data (before the intervention), indicate lower investments in education in the intervention areas. Using birth cohort information combined with detailed regional information on the amount and timing of investments, the author can trace which respondents in the later surveys were exposed to the program. Using a difference in difference type of approach, she estimates a private rate of return of primary education for those exposed to the program in the order of 8.6 to 10.6 percent. This estimate is lower than most of the previous estimates but in line with the decline in estimated rates of return over time. World Bank (1990) reports estimates decreasing from 19 percent in 1982 to 10 percent in 1986. Duflo also shows that investments in primary school infrastructure have led to an increase years of education. For each new school built per 1000 children, the average years of education of children aged 2 to 6 increased by 0.12 to 0.19. These investments translated into an increase in wages of 1.5 to 2.7 percent for each additional school built per 1000 children. The results indicate that the rapid expansion of the Indonesian school system in the seventies did not result in a deterioration of the quality of education.

The effects of improved health on earnings are even harder to obtain. The only objective health status variables which are collected on a regular basis are nutritional indicators, which are only collected for young children and thus do not provide a basis for economic rate of return calculations. Self reported health care status is biased because norms of what constitutes an illness vary for different groups of the population. A common finding in Indonesia for instance is that wealthier households report ill more often, a finding that is probably not caused by differences in the underlying health status between poor and rich. These problems are not unique to Indonesia. Strauss and Thomas (1998) review the empirical evidence. Using height as a proxy for health, they do find positive returns to health on the labor market, even after correcting for education. This sort of analysis has the same shortcomings as the standard Mincerian earnings equation to estimate returns to education. Length could very well be a proxy for good upbringing, which does not only affect health but also unobservables such as entrepreneurial spirit. If the two are correlated, the estimates

suffer from a omitted variable bias and wrongfully allocate the effect of entrepreneurial spirit to good health.

Dow et al (1997) use experimental data to get at the effect of health on labor market outcomes in Indonesia. The study is based on data generated by the Indonesian Resource Mobilization Study in the early 1990s. This study involved an increase in the price in a set of randomly chosen health clinics in two provinces of the country. The main objective of the study was to get an estimate of the price elasticity of health care demand (which will be discussed later). A simple difference in difference approach indicates that, when using self-reported health status, those living in the areas where prices were increased experienced an *improvement* in health status. At the same time, as we will discuss later, the demand for health decreased in these areas. While few will argue that doctors make patients more sick, a more likely explanation is that self-reported health is influenced by utilization. Those who visit a doctor are more likely to report themselves ill, irrespective of their healthy status. More objective measures show weak evidence for deteriorated health in the treatment areas (only significant for males, not for females). The percentage reporting that they cannot walk 5 kilometers, the number of days that activity were limited all show significant positive effects as a result of the price increase for males. Having presented the evidence of the price increase on health, the authors continue to investigate the indirect effect on labor market participation and earnings. For males no significant effect on labor market participation are found. For females, however, a significant negative effect on labor market participation is found as a result of the price increase. As a result of the price increase the female labor market participation dropped by 7.3 percent point. Wage regressions show a negative of effect of the price increases of 15 percent for males (in the wage sector). For females no significant effect on wages are found. Summarizing, the findings of this study indicate that there are effects of health on labor market outcomes, in the direction as hypothesized, but not always significant in every case.

Indirect effects

One can think of many indirect effects of education and health and it is beyond the scope of this paper to review all of them. Instead, we will focus on two papers which allow us to say something about the effects of parent's education on the nutritional status and education investments of their children. Using the 1998 Susenas household survey, Skoufias (1999) finds positive significant effects of mother's education on the nutritional status of children aged zero to five. His regression estimates, which correct for unobserved regional variations, consumption, sanitation facilities of the household, father's education and the household composition, indicate that if the mother's education is beyond primary, the nutritional status of boys measured in terms of weight for age improves (see Table 5). For girls a significant effect of education is only found if the education of the mother is more than senior secondary in urban areas or the education of the household head is junior secondary in rural areas. No effect is found for the father's education. Pradhan (1998) investigates the effects of parent's education on boys and girls enrollment in secondary school. Correcting for similar variables as Skoufias, he finds that one additional year of education of the mother increases enrolment by 0.9 percent point for girls and 1.5 percent point for boys. Stronger and larger effects are found for the father's education. The mother's education has more effect on reducing delayed enrollment than the father's education.

Table 5 Returns to parental education on malnutrition of children aged 2-6 as measured by weight for age Z score

	Rural				Urban			
	Boys		girls		boys		girls	
	coeff	t value	coeff	t value	Coeff	t value	coeff	t value
Mother's education level (primary excluded cataogy)								
junior high	0.260	2.76	-0.072	-0.67	0.096	0.58	-0.061	-0.43
senior high	0.216	1.60	-0.133	-0.72	0.683	3.91	0.064	0.4
more than senior high	-0.131	-0.38	0.451	0.98	0.869	2.28	1.026	3.61
Household head's education level								
junior high	0.059	0.79	0.198	2.08	0.11	0.59	0.003	0.02
senior high	0.117	1.06	0.139	1.16	0.034	0.2	-0.138	-0.91
more than senior high	0.079	0.34	-0.036	-0.11	-0.087	-0.33	-0.297	-1.31

Source: copied from Skoufias (1999). Regression also included age, family composition, consumption, housing and asset variables as well as a set of regional dummies.

We are not aware of any studies that make a serious attempt to estimate the indirect effect of investments in health in Indonesia

3. Demand for Education and Health

The evidence presented in the preceding sections explain, at least in part, the interest of the Indonesian government in welcoming consumption of social services. However, those arguments do not, in and of themselves, provide justification for government intervention. Typically, the case for government intervention is based on the argument that education and health generate positive *externalities* for society as a whole, as well as the *equity* concern that without public price subsidies only the wealthy would be able to afford health care.

This latter question can be investigated by studying the demand for education and health. In particular, the issue arises as to what might be the impact of the government reducing subsidies in the social sectors; a question of great current import given the particularly stretched public finances of the Indonesian government following the economic crisis. A key empirical question relates to the sensitivity of education and health utilization to prices. If individuals are very sensitive to prices, then reducing subsidies would offer little relief to the budget and the education and health systems run the risk of no longer reaching the whole population. Moreover, if the poor are more price sensitive than the nonpoor, then reducing subsidies will lead to greater inequality in access to education and health services. An understanding of such behavioral responses is a key input into any discussion of social sector spending reform.

While these issues are of unquestioned importance, investigating them empirically poses considerable challenges, from both a technical perspective as well as in terms of data

requirements. We have not been able to study these issues directly with the data available to us, but present below a brief summary of the main findings from recent research into these questions.

Education

Alisjahbana (1994) analyzes the demand for schooling recognizing that quality varies across schools. Her study is based on the 1989 Susenas household survey. Quality of schools is estimated using an indirect method which attributes regional variation in schooling expenditures which cannot be explained by household characteristics to differences in school quality. Using distance as a proxy for prices, she finds significant negative effect of the distance to the nearest school for all age groups. The results indicate that building more schools, and thereby reducing the distance, will yield an increase in enrollment, a result which was also found in Duflo (forthcoming). Her quality adjusted estimated price elasticities are reproduced in Table 6. Significant negative own price elasticities and positive cross price effects are found for junior secondary schools with the exception of the own price effect for public schools. At the primary level no significant effects are found. The same holds for the own price elasticities at the junior secondary level. At this level the opportunity costs of time – proxied by the local wage rate – is a more important determinant for enrollment than the costs of education. The author finds some evidence of gender differences. The estimates on the education of the mother, the female local wage rate and the constant term in the school participation model vary significantly by gender. This implies that, cetirus paribus, male children have a higher probability of enrollment in a private college relative to female children in the same age group. Better educated mothers tend to provide more schooling opportunities for boys at private schools. If the imputed female adult wage rates reflect the earning opportunities for the mother, better opportunities result in higher enrollment probabilities of the female children at private schools.

Table 6 Own and cross quality adjusted price elasticities of private and public schooling by schooling level (* indicates significance at the 5 percent level)

	primary school		junior secondary		senior secondary	
with respect to the price of:	public	private	public	Private	public	private
Public	-0.078	0.711	-0.453	0.771*	0.211	0.236
Private	0.213	-0.546	0.126*	-0.296*	-0.580*	-0.122

Source: Alisjahbana (1994)

Health

There are very few published studies on the demand for health in Indonesia. An important, but as yet unpublished, study was carried out in a joint research project partially funded by the World Bank Research Department. The Indonesian Resource Mobilization Study (IRMS) is an explicit social experiment in two provinces of Indonesia (East Kalimantan and West Nusa Tengara) designed to measure behavioural responses to alternative health pricing policies. The brief summary of preliminary results presented here is taken from an interim progress report presented to the World Bank Research department (Gertler, 1995).

The IRMS project applies an experimental case-control longitudinal study design that observed individuals and providors before and after experimentally designed fee changes in treatment and control areas of the two Indonesian provinces of KalTim and West Nusa Tengara. A baseline survey of 6000 households from both treatment and control districts, plus a concurrent survey of the over 1000 medical care providers that served these households, was fielded in 1991, before the implementation of fee increases in the treatment areas. A follow up survey of the same households and providers was conducted in 1993 after the fee increases in treatment areas and quality changes in both areas, but before most fee increases in the control areas. This approach was porposively designed to help the investigators overcome the serious endogeneity problems which limit traditional approaches to estimating demand elasticities.

Preliminary findings from this study indicate that demand for hospital care in these two provinces is very elastic for upper range of the observed price distribution. Raising user fees beyond Rp 5,000 could lead to absolute reductions in revenues for hospitals. The demand for health center and health subcenter care are much more price inelastic implying that substantial revenues would be raised if fees were raised to Rp 1000 at health subcenters and Rp 1500 at health centers. As price elasticities are negative and significant, increasing user fees at health centers, subcenters and hospitals would also reduce utilization. Moreover, utilization would drop twice as fast among individuals in the poorest quintile. Looking at the effect on *total* health utilization (which captures also the switch from public to private sector providers) yielded the finding that as a result of a fee increase the number of poor using public facilities not only falls proportionately more than other groups, but proportionately more of the poor do not obtain *any* formal medical care. These broad findings were supported also by analysis at the health provider level. Finally, the study provides some evidence that raising prices of health services leads to observed deterioration of directly observed health status.

5. Institutional Background and Government Spending on Education and Health

In previous sections we have documented the centrality of education and health to social welfare in Indonesia, and have suggested that absent intervention to guarantee access to education and health services, there would likely be serious inequalities in education and health outcomes. It comes as no surprise therefore that the government of Indonesia has been active in the education and health sectors. In this section we provide a brief overview of the institutional background and the magnitude of government involvement in these two social sectors.

Education

Education in Indonesia starts with 6 years of primary school, followed by 3 years of junior secondary school. Together these form basic education. Children are required to enroll in primary school by age 7. Senior secondary school starts at age 13 and takes another 3 years to complete. In 1994 school attendance was made obligatory up to the age of 15 so that basic education became mandatory. Tertiary education is delivered through a wide range of

institutions which provide a range of programs ranging from one year certificates to four year undergraduate degree programs. These are followed by masters and doctorate programs.

Education at all levels is delivered through both public and private institutions with private education playing an increasingly larger role at each higher level of education. At the primary level, private education constitutes approximately 17 percent of enrollment (the main private providers are religious schools serving about 11 percent of all students enrolled at the primary level) (World Bank 1998). At the two secondary levels, private schools serve respectively 40 and 50 percent of all enrolled students.[x] In higher education 66 percent of students are enrolled in private institutions. In general, private schools (except for those at the top end) are considered to be of lower quality than public schools. A recent study by the World Bank indicates that private schools have fewer school inputs, more part-time teachers, and less qualified teachers in terms of certification (World Bank, 1998). Unit costs at private Islamic junior secondary schools, for example, are almost half those in public schools (Malo et. al, 1994).[xi]

Public expenditure on education constitutes approximately 2.9 percent of GDP which is equivalent to 14 percent of the government budget (1997). The consolidated government budget for education is presented in Table A 1. The largest share of education spending has been devoted to primary education (52%), followed by 18 and 13 percent for junior and senior secondary respectively. Some 30 percent of expenditures are allocated to development and the remainder to recurrent spending.

Household expenditure on education is also substantial. The SUSENAS household survey records such expenditures. Total yearly household education expenditures according to the 1998 Module amounted to 12,400 billion rupiah[xii], compared to a total consolidated government budget in 1998 for education of 14,852 billion rupiah (Table A.1). Hence, private spending on education is nearly as high as that of the government.

Health

The goal of Indonesia's public health care system is to provide universal primary health care implemented through a wide network of (subsidiary) public health centers (*puskesmas*) which provide outpatient services. The network consists of over 7100 health centers, roughly 23,000 subscenters, 4000 mobile clinics, and 19,000 village maternity homes. Over 100 of the health centers also have limited inpatient facilities. On average, health centers have roughly 18 paid staff. In 1995, 1.1 doctor was present per center (BPS 1997). The centers are expected to implement some 18 programs, which include curative health, school health, health education, and so on. In addition, health center staff can refer patients for treatment to 71 publicly run class D, 214 class C, 54 class B and 4 class A hospitals, the latter being more central and offering a wider range of services. The village midwife program (Bidan di Desa ,BDD) launched in 1993, established access to family planning and maternity care to the village level.

The private sector plays an important role in the delivery of health care. According to the 1998 SUSENAS, 52 percent to a private modern provider, 43 percent of all outpatient visits went to a public facility, and 4 percent to a traditional practitioner. 40 percent of all inpatient

visits were to private facilities. Many of the doctors working in public facilities also keep private practices. Before the crisis, the trend was clearly in the direction of greater private sector utilization. Between 1995 and 1997, the outpatient contact rate (percent of the population that visited a health facility in the past month) increased by 0.2 percentage points to 6.7 percent for the private sector whereas it dropped by 0.3 percentage points to 6.7 percent for the public sector.

Actual and realized government health expenditures are provided in Table A 2. Indonesia's government spends around 0.5 percent of GDP on health which equals 3.5 percent of total government expenditures. This is low compared to other countries in the region. For example, Malaysia spends 5.6 percent of government expenditure on health while the government of the Philippines spends 3.8 percent of its budget on health (World Development Report, World Bank, 1997).

For the purpose of this study, health budget data have been allocated to primary, hospital and routine expenditures. In section 4 we wish to relate benefit incidence to the utilization of the services. Programs of which one only benefits when one attends the facility are allocated to the respective facility. Other more general programs, such as general educational programs, are grouped in the "other" category. The exact allocation of programs to type of care is given in Table 7. Table A2 in the appendix presents the allocation by budget line.

Table 7 Allocation of health programs to primary care, hospitals and others

PROGRAM	Hospitals	Primary Care	Others
Formal Education			x
Youth Development			x
Community Health Education		x	
Health&Referral services at Hospitals	X		
Community Health Services		x	
Community Disease Control		x	
Nutrition Improvement		x	
Food and Drug Control		x	
Traditional Medicine Supervision			x
Women's Role			x
Environmental Health in Residential Area			x
Water Supply and Management			x
Assessment&Research of Applied Science			x
Information System and Development			x
National Law&Regulation Development			x
Improvement of Infrastructure&Facilities of Gov Officials			x
Improvement of Efficiency of Gov Officials			x
Education&Training of GovOfficials			x
System Utilization and Control			x

The health module of the 1998 SUSENAS indicates that households spend 7,833 billion Rupiah on health per year. The module records health treatment in the past year separately for inpatient, outpatient, check ups and self-treatment. The expanded monthly health

expenditure figure in the Core questionnaire, which is collected using only one question, yields a total household health expenditure of 7,584 billion Rupiah. For comparison, in 1997/1998 the government spent 3,518 billion Rupiah on health. Health is thus financed to a much greater extent by out of pocket payments than is education.

Regional patterns

National budget on government health and education spending do not provide information on regional patterns in public provision of services. Since many ministries are involved in setting regional budgets, it is hard to obtain a good data of all public health and education spending at the provincial level. For this reason we have decided to focus on input indicators as they are reported in Table 8. Since teachers' salaries are the main budget line in the education budget, pupil/teacher ratio's are a good indicator for the per capita regional education spending. There are marked disparities across provinces. Low pupil teachers ratios are found in Yogyakarta, Bali, Central and South Kalimantan and North Sulawesi. High ratios are found in West Java, West Nusa Tengara and East Timor. In most provinces, the private sector public schools have higher pupil/teacher ratios. For health, Table 8 shows the number of hospital beds and health clinics per capita. The two indicators do not tell the same story. A high concentration of hospitals is found in North Sumatra, Jakarta, Yogyakarta, Bali and North Sulawesi. These provinces generally score quite good on the health output indicators (see Table 1). A high concentration of heath clinics is found in Bengkulu, East Timor, South and East Kalimantan, SouthEast Sulawesi and Irian Jaya. These provinces scored worse than average on the child mortality indicator and around average on the child malnutrition indicator (table 1).

Table 8 Regionally disaggregated supply of public education and health facilities

Province	Pupils / nr of teachers in primary schools 1998/1999 /a			hospital beds per 100,000 persons (1997)	Health clinics (puskesmas) per 100,000 persons (1997)
	Public	Private	Total		
Aceh	23.5	23.2	23.5	49.5	5.63
North Sumatra	23.1	25.8	23.5	104.9	3.38
West Sumatra	21.2	32.4	21.5	75.3	4.49
Riau	24.5	25.3	24.5	43.5	3.37
Jambi	20.1	21.1	20.1	37.6	4.84
South Sumatra	23.6	22.2	23.5	51.7	3.65
Bengkulu	19.7	21.9	19.7	39.8	8.13
Lampung	23.2	30.6	23.5	25.2	3.01
Jakarta	24.2	21.1	23.4	162.4	3.44
West Java	29.9	22	29.6	36.7	2.69
Central Java	22	21.1	21.9	58.2	2.77
Yogyakarta	14.7	17.1	15	122.1	4.12
East Java	19.3	19.5	19.3	51	2.76
Bali	14.9	26.2	15.1	98.5	3.76
West Nusa Tengara	25.3	28.6	25.3	26.7	3.03
East Nusa Tengara	23	24.9	23.8	46.8	5.52
East Timor	25.5	22.8	25	63.9	7.67
West Kalimantan	21.8	24.6	22	54.9	4.89
Central Kalimantan	15.4	22.5	15.5	31.6	0.75
South Kalimantan	16.3	18.6	16.4	64.3	6.27
East Kalimantan	19.9	26.4	20.2	86.8	6.01
North Sulawesi	14.5	13.9	14.4	106.2	5.09
Central Sulawesi	18.6	24.4	18.8	62	6.3
South Sulawesi	19.5	19.5	19.5	70	4.41
South East Sulawesi	21.6	17.3	21.6	40.5	7.72
Maluku	22.3	18.4	21.4	75.1	7.29
Irian Jaya	20	20.8	20.3	77.7	8.94
Indonesia	22.3	21.8	22.3	60.6	3.35

Source: Education data from Indonesian Minsitry of Education web site http://www.pdk.go.id/ , health data from Departamen Kesehatan RI Pusat Data Kesehatan Jakarta

4. Static benefit incidence of education and health spending

Benefit incidence analysis describes government spending on health and education across income groups. Government spending is viewed as an indirect transfer from the government to the household tied to the condition that the household uses the government services. The unit transfer is calculated as total government spending divided by the number of units consumed by the population. Units could be enrolment in school, visits to a health center etc.

The benefit incidence of the government spending to household in a given consumption quintile is calculated as the total number of units consumed by households in that quintile multiplied times the unit transfer amount.

The method has many implicit assumptions. First, total government spending is taken as the benefit that the households receive. The value of the service that is provided is treated similar to a monetary transfer. Of course this is not realistic. High administrative costs, which would make the provision of the service less efficient that when provided by the private sector, do not change the value of implicit transfer. In addition, it is assumed that the unit costs are the same across all facilities. Considering the wide disparities in quality, it is clear that this is a strong assumption. The quality of services in urban areas would make the unit transfers higher. On the other hand, the low economies of scale for remote facilities would increase the value of the unit transfer in rural areas. More fundamentally, a more sensible measure of the benefit would be the compensating variation, that is, the amount households would be willing to give up in income in order to receive the service. Especially in health care, there is a risk that households will over consume if services are provided for free at easy access. The actual consumption in that case is not a good indicator for the value that the households attach to the service.

6.1 Classic benefit incidence analysis

Utilization of education and health facilities

Table 9 presents gross enrollment ratios by per capita consumption quintile from the SUSENAS 1998 data.[xiii] The high primary school enrollment ratios across the income distribution underscore the success of Indonesia in reaching universal enrollment at the primary level. The utilization of private schools is the highest in the poorest and richest quintiles. Private schools are very heterogeneous, providing on the one hand, low cost, low quality education for children from poor households, and high cost, high quality education for children from the rich quintiles. At the secondary level, enrolment rates are higher for children from richer quintiles. The gross enrollment ratio ranges from 55 percent for the poorest quintile to 91 percent for the richest quintile for junior secondary education. The skewness of publicly provided junior secondary education is somewhat less as children from rich households tend to opt more often for private education. The distribution of senior secondary education is even more skewed. The gross enrollment rate ranges from 25 for the poor to 75 percent for the rich. Even more than for the junior secondary level, the private sector utilization is higher for children from richer households.

Table 9 Gross enrolment rates by level and public/private in 1998 (percentages)

		Per capita consumption quintile					
		1 (poor)	2	3	4	5 (rich)	total
Primary	Public	93.66	96.51	97.74	95.86	89.82	95.00
	Private	12.02	11.24	10.66	12.60	18.70	12.60
	Total	105.69	107.75	108.41	108.47	108.52	107.59
Junior secondary	Public	36.12	44.86	51.51	56.91	62.41	49.29
	Private	18.72	22.25	25.07	27.34	29.05	24.06
	Total	54.85	67.10	76.58	84.25	91.46	73.35
Senior secondary	Public	12.56	17.64	23.33	30.72	40.65	24.96
	Private	12.41	16.59	21.95	27.48	34.01	22.48
	total	24.98	34.24	45.27	58.23	74.64	47.44

Source: Author's calculations based on 1998 Susenas household survey

The contact rates for primary health facilities in 1997 are presented in Table 10. [xiv] The utilization of public primary health care facilities is fairly evenly distributed. About 6 percent of the population visited a public health clinic in the past month. The utilization is the highest for the middle quintiles. The utilization of (modern) private sector providers is slightly higher than that of public facilities. The distribution of the utilization is however rather pro-rich. Individuals from the richest quintiles visit a private primary health care provider twice as often as individuals from the poorest quintiles. Public hospitals still provide the majority of hospital services. 0.69 percent of the population visited a public hospital in the past month. Hospital utilization, both public and private, is pro-rich in distribution. For public hospitals, the contact rate of the richest quintile is about 3 times that of the poorest quintile. For private hospitals it is about 6 times as high.

Table 10 Contact rates for primary health facilities and hospitals in 1997 (percent of population which visited facility at least once in past month)

		Per capita consumption quintile					
		1 (poor)	2	3	4	5 (rich)	total
Primary Health Care	public	5.81	6.21	6.41	6.7	5.46	6.12
	private	4.14	5.31	6.13	7.27	8.85	6.34
	Total	9.65	11.11	12.03	13.47	13.78	12.01
Hospital	Public	0.39	0.52	0.64	0.79	1.10	0.69
	Private	0.17	0.25	0.34	0.48	1.07	0.46
	total	0.55	0.76	0.96	1.26	2.14	1.13
Traditional Health Care		0.59	0.66	0.67	0.69	0.54	0.63

Source: Author's calculations based on 1998 Susenas household survey

Note: Public and private contact rates do not add up to total because individuals can visit both public and private facilities

Information on the utilization of public services can be linked to data on public subsidies to calculate the implicit indirect transfer. We present data for the budgetary year 1997/1998 and match those with utilization observed in the 1998 SUSENAS.

For education, the total government budget in 1997/1998 was 14,842 billion Rupiah (see Table A 1). The total outlays by level of education (using the shares of 1997) were 7,738 for primary, 2,629 for junior secondary and 1,901 billion Rupiah for senior secondary. This includes both routine and development expenditures. According to the SUSENAS 1998, the total number of students enrolled in public schools was 25,168,888 for primary, 6,965,463 for junior secondary and 3,137,467 for senior secondary. This results in a unit transfer amount of 307,439 Rupiah per student per year in public primary school, 377,405 Rupiah in public junior secondary and 605,921 Rupiah for a student in public senior secondary school.

The distribution of government spending on education is presented in Table 11. Government expenditures on primary education have a pro-poor distribution. With practically universal primary school enrolment, the pro-poor bias is largely driven by the fact that poorer households tend to have more young children. The share of the total transfer to each consumption quintile is almost equal to the share of the population in the relevant age group. The number of students from the poorest quintile in public primary schools is almost twice the number of children from the richest quintile.

For junior secondary education we find that most of the benefits accrue to the middle consumption quintiles. Here there are two effects. On the one hand, enrollment is higher in richer consumption quintiles (see Table 9). On the other hand, the number of children in the relevant age is lower for the richer consumption quintiles. The result is a fairly even distribution of benefits across the four richest quintiles with the households from the poorest quintile reaping a somewhat lower 16 percent of the total transfer.

For senior secondary education, the population shares in the relevant age goups are about equal across the income distribution. As a result the benefit incidence results are largely driven by differences in enrollment. Benefits are distributed very regressively. The total transfer to the richest quintile is more than triple that to households in the poorest quintile.

Table 11 Benefit indicence of government education spending in 1998

		Per capita consumption quintile					
		1 (poor)	2	3	4	5 (rich)	Total
	Total population	40,119,272	40,119,272	40,119,272	40,119,272	40,119,272	200,596,360
Primary	Population age 7- 12	6,862,229	6,200,307	5,427,431	4,765,476	3,791,548	27,046,991
	percent of total	25.4	22.9	20.1	17.6	14.0	100
	Public school students	6,250,513	5,914,599	5,220,348	4,485,724	3,297,704	25,168,888
	Per capita transfer	47,898	45,324	40,004	34,375	25,270	38,574
	percent of total	24.8	23.5	20.7	17.8	13.1	100.0
Junior Secondary	Population age 13 - 15	3,083,241	3,020,282	2,906,587	2,693,807	2,314,337	14,018,254
	percent of total	22.0	21.5	20.7	19.2	16.5	100
	Public school students	1,110,416	1,406,931	1,495,913	1,520,078	1,432,125	6,965,463
	Per capita transfer	10,446	13,235	14,072	14,299	13,472	13,105
	percent of total	15.9	20.2	21.5	21.8	20.6	100
Senior Secondary	Population age 16 - 18	2,533,839	2,612,024	2,601,723	2,611,228	2,671,501	13,030,315
	percent of total	19.4	20.0	20.0	20.0	20.5	100
	Public school students	298,259	444,179	585,898	750,580	1,058,551	3,137,467
	Per capita transfer	4,505	6,708	8,849	11,336	15,987	9,477
	percent of total	9.5	14.2	18.7	23.9	33.7	100

Note: Per capita transfer is defined as the unit transfer times the number of students enrolled in school divided by the population. By construction, the population is the same in every quintile.
Source: Authors calculations based on 1998 Susenas data and budget data reported in Table A1 in appendix.

In health, the unit of analysis requires some further thought. Using the contact rates as presented in Table 10 is unsatisfactory because it does not take account of the number of times the individual frequented the service. Health services are also more heterogeneous than education services. Hospitals especially provide both in- as well as outpatient services. Obviously, the costs and the associated transfer of an inpatient day are much higher than for an outpatient visit. Under the assumption that private facilities charge the true costs for their services, Pradhan and Prescott (1999) calculate that an inpatient day in a private hospital is about 10 times as expensive as an outpatient visit to a private provider[xv]. For this reason, we choose to treat in the analysis an inpatient day as equivalent to 10 outpatient visits. The unit transfer amount is based on the total number of visits.

The total government health budget for 1997/1998 was 3518.3 billion million Rupiah of which 2038.1 billion Rupiah was allocated for primary health care and 718.5 billion Rupiah to hospital care. The remainder was allocated to programs such as health education and training, management and support which could not be attributed to a service. The 1998 SUSENAS recorded 144 million outpatient visits (based on the Core data with one month recall) and 1.9 million (based on Module data with one year recall) inpatient days per year at public primary health services. At public hospitals, the recorded number of outpatient visits was 19 million and the number inpatient days 10 million. This results in a unit transfer amount of 7,100 Rupiah per visit in a public primary health care facility and 5,904 Rupiah per visit in a public hospital.

Table 12 shows the distribution of government subsidies across consumption quintiles. For primary care, the bulk of the transfers is associated with outpatient visits. Only 11 percent of the total transfer covers inpatient days. Outpatient visits to public primary health care facilities are fairly evenly distributed with a slight pro-poor bias. The same holds for inpatient days although the bias is slightly pro-rich. The resulting per capita transfer is also distributed rather evenly ranging from 10,786 Rupiah for the poorest quintile to 9,098 Rupiah for the richest. In hospitals, the largest share of the transfer is the result of inpatient days. These are distributed very pro-rich. Individuals from the richest quintile spend 4 times as many days in a hospital than individuals from the poorest quintile. The resulting per capita transfer ranges from 1,825 Rupiah for the poorest quintile to 7,167 for the richest.

Table 12 Benefit indicence of government health spending in 1998

		Per capita consumption quintile					
	Quintile	1 (poor)	2	3	4	5 (rich)	Total
	Total population	39,680,636	39,680,636	39,680,636	39,680,636	39,680,636	198,403,180
Primary Health Care	Outpatient visits	30,683,676	30,394,428	28,992,324	30,037,044	24,618,348	144,725,820
	percent of total	21.2	21.0	20.0	20.8	17.0	100
	Inpatient days	367,540	380,047	347,611	358,077	436,330	1,889,605
	percent of total	19.5	20.1	18.4	18.9	23.1	100
	Nr. of units	34,359,076	34,194,898	32,468,434	33,617,814	28,981,648	163,621,870
	Per capita transfer	10,786	10,734	10,192	10,553	9,098	10,273
	percent of total	21.0	20.9	19.8	20.5	17.7	100
Hospitals	Outpatient visits	1,875,252	2,453,868	3,336,216	4,100,784	7,034,724	18,800,844
	percent of total	10.0	13.1	17.7	21.8	37.4	100
	Inpatient days	1,038,834	1,108,553	2,123,689	1,905,582	4,113,913	10,290,571
	percent of total	10.1	10.8	20.6	18.5	40.0	100
	Nr. of units	12,263,592	13,539,398	24,573,106	23,156,604	48,173,854	121,706,554
	Per capita transfer	1,825	2,014	3,656	3,445	7,167	3,621
	percent of total	10.1	11.1	20.2	19.0	39.6	100

Source: Authors calculations based on 1998 Susenas data and budget data reported in Table A2 in appendix.

6.2 Sensitivity of results with respect to the economies of scale assumption

The benefit incidence results for education indicate that the number of children present in a household is an important factor in explaining the outcome of the analysis. It seems that poorer households tend to have more children and therefore stand to receive more of the government subsidies linked to children (such as education). On the other hand, smaller families contain a larger share of older people which utilize health care more often. The positive correlation between age on morbidity was already shown in Figure 5. Table 13 provides further evidence. Larger households tend to have a larger share of children in the school going age groups. Smaller household have a higher frequency of visits to medical providers.

Table 13 Faction of children, average age and health care utilization by households size

Household size	Share of children (percentage)			Average age of household members	Number of outpatient visits per capita in past month (per capita)			
	7 to 12	13 to 15	16 to 18		Public	Private	Total (modern)	Traditional
1	0.05	0.46	3.16	48.86	0.09	0.12	0.21	0.011
2	1.85	1.70	3.37	44.87	0.08	0.12	0.19	0.010
3	6.75	3.60	3.92	29.04	0.07	0.09	0.17	0.008
4	13.79	5.89	5.21	25.90	0.07	0.08	0.15	0.006
5	16.39	8.17	7.18	25.29	0.06	0.07	0.14	0.007
6	17.21	9.26	8.39	24.78	0.06	0.07	0.13	0.006
7	17.48	9.90	9.45	23.94	0.06	0.06	0.12	0.005
8 and over	17.22	9.56	9.64	23.19	0.06	0.06	0.11	0.006

Source: Author's calculations based on Core of 1998 Susenas survey.

The notion that poorer households are those with more children is very sensitive to assumptions about economies of scale in household consumption (Lanjouw and Ravallion, 1995). The most common assumption, and one we have implicitly made so far, is that there are no economies of scale in consumption. Thus, a unitary household with consumption x is equally well off as a household of n members with consumption n times x. Following Lanjouw and Ravallion (1995) we test the sensitive of the results with respect to this assumption by ranking households according to C/n^{θ} where C is total household consumption, n is the number of family members and θ is a parameter between zero and one indicating the de gree of economies of scale in the household.[xvi] θ equal to one corresponds to the no economies of scale assumption.[xvii]

Benefit incidence results under different economies of scale assumptions are shown in Table 14. For a ll education services, we find that the implicit subsidies become more pro-rich if we assume higher economies of scale. For primary education, as θ becomes smaller, the implicit transfer decreases for the poorest two quintiles and increases for the richest three quintiles. Nevertheless, under all values of θ, the poorest three quintiles get most of the benefits. Thus

the finding that the relatively poor are the main beneficiaries of primary education transfers is fairly robust to alternative assumptions about the degree of economies of scale in consumption.

This does not hold for secondary education. Under the zero economies of scale assumption most of the benefits of junior secondary education went to the middle quintiles. The introduction of any economies of scale however, would indicate that the benefits are more regressively distributed. With θ at 0.6 for example, the poorest quintile receives barely half the benefits received by the richest quintile. For senior secondary education we find an even more skewed distribution of transfers if economies of scale are allowed for.

Table 14 Sensitivity of implicit transfer of public education and health services with respect to economies of scale assumption (Implicit government transfer in Rupiah per capita per year)

		Per equivalent person consumption quintile				
	θ	1 (poor)	2	3	4	5 (rich)
Primary	1	47,898	45,324	40,004	34,375	25,270
	0.8	45,311	43,380	40,240	36,371	27,570
	0.6	41,139	42,671	40,497	38,527	30,037
	0.4	36,750	41,332	41,964	40,218	32,607
Junior Secondary	1	10,446	13,235	14,072	14,299	13,472
	0.8	9,421	12,308	14,298	14,871	14,627
	0.6	8,342	11,879	14,149	15,494	15,660
	0.4	7,217	11,364	14,048	16,159	16,737
Senior Secondary	1	4,505	6,708	8,849	11,336	15,987
	0.8	3,953	5,805	8,920	11,554	17,152
	0.6	3,396	5,373	8,608	11,861	18,147
	0.4	3,237	4,981	8,086	12,185	18,896
Primary Health Care	1	10,785	10,734	10,192	10,553	9,097
	0.8	10,983	10,829	10,569	10,445	8,537
	0.6	11,273	11,136	10,578	9,983	8,392
	0.4	11,915	11,062	10,346	9,859	8,180
Hospitals	1	1,825	2,015	3,656	3,445	7,167
	0.8	1,354	2,648	3,361	3,419	7,327
	0.6	1,442	2,328	3,775	3,315	7,246
	0.4	1,610	2,316	3,671	3,408	7,102

Source: Authors calculations based on 1998 Susenas data and budget data reported in Table A1 and A2 in appendix.

For health, however, we find that the implicit subsidies become more pro-poor if economies of scale are introduced. A likely explanation is that health care is to a large extent consumed by the elderly. Under the traditional assumption of zero economies of scale, the elderly do not tend to be highly featured in the poorest quintiles (the counterpoint to large households—households with many children—highly represented among the poor). Allowing for some economies of scale alters this pattern. The results are clearest for primary health care. Whereas under the assumption of no economies of scale the poor received slightly more benefits on a per capita basis, under the assumption of positive economies of scale – for

example θ equal 0.6 – the poorest quintile receives 34 percent more than the richest quintile. Public transfers associated with hospital care remain, even under the assumption of significant economies of scale, regressively distributed.

6.3 Public versus private expenditures

Out of pocket expenditures provide a major source of financing of education and health services. The private sector plays an important role in the delivery of both education and health services. These services are financed through user fees. But also public services require household contributions. In education, households pay registration fees, school uniforms, equipment and travel expenses for their children. Public health centers also charge user fees. By contrasting the implicit transfers of public subsidies with out-of-pocket payments across consumption quintiles, we obtain insight into the public/private financing shares of health and education services across in the income distribution.

Figure 6 presents private and public expenditures on primary education (see Table A3 to A5 for details). The lower sections of the bars correspond with the per capita transfer amount given in Table 10. The amounts labeled "household public" show the per capita education expenditures of households with children in public schools. The top sections of the bars show the per capita expenditures of households in private schools. The figure indicates that up to the forth quintile, almost all education expenditures are in public schools. The high utilization of private schools in the poorest quintile translates into only 2 percent of total financing for the poorest quintile. Children from richer quintiles have higher private spending per student in public schools. Even though the number of children enrolled is lower in the richer quintiles, the per capita household contribution increases slightly across quintiles. The share of government financing decreases continuously as the households get richer. While the government finances 82 percent of total expenditures for the children from the poorest quintile, it finances only 57 percent for children from the richest quintile.

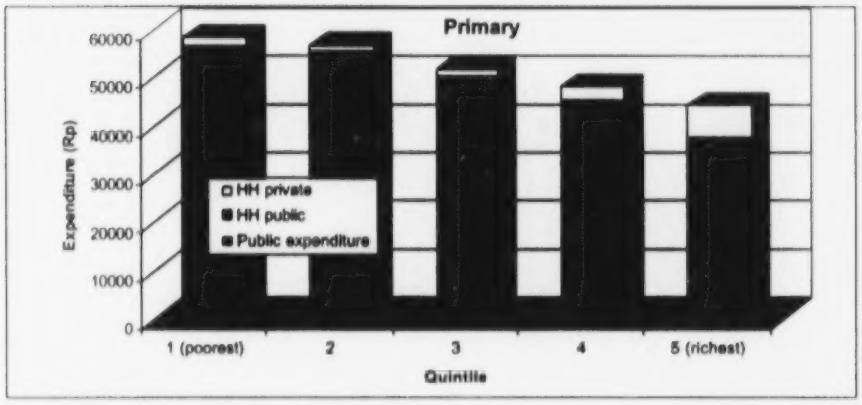

Figure 6 Public and private expenditures on primary education by consumption quintile in 1998 (Rupiah per capita per year)

Figure 7 and 8 show the public private mix for junior secondary education (see also Table A 4 and Table A 5 in the appendix). For junior secondary, the number of student in public schools was rather evenly spread across consumption quintiles and hence so is the public transfer. The private contributions however, increase substantially as the households of the children get richer. The per capita private expenditures of children in public schools ranges from 5,300 Rupiah per year for children from the poorest quintile to 14,000 Rupiah per year for children from the rich quintiles. Also per capita household expenditures in private schools increase substantially as the households get richer. In senior secondary school, all expenditures are distributed pro-rich. Rich households spend more in public schools, receive more public transfers and spend more in private schools.

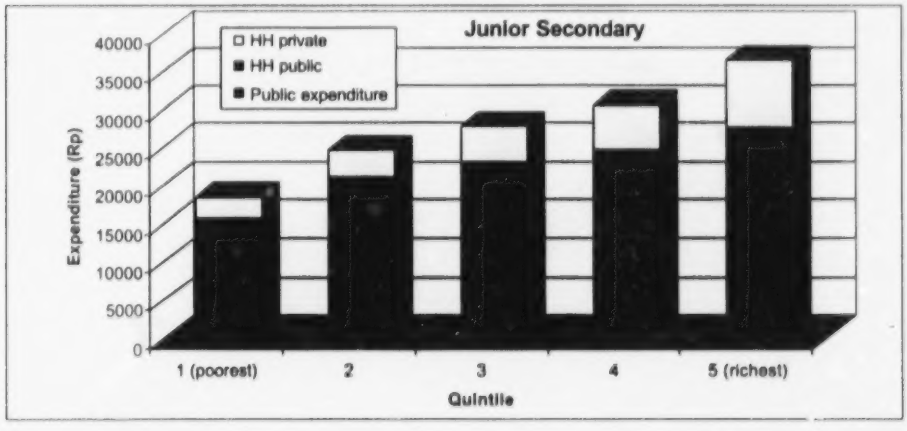

Figure 7 Public and private expenditures on junior secondary education by consumption quintile in 1998 (Rupiah per capita per year)

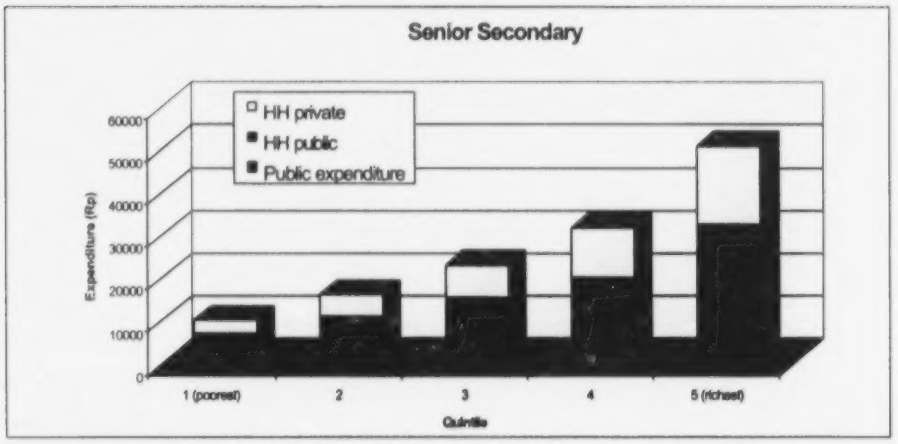

Figure 8 Public and private expenditures on senior secondary education by consumption quintile in 1998 (Rupiah per capita per year)

The distribution of private and public expenditures on health are given in Figure 7 and 8 (see also Table A 6 and Table A 7 in the appendix). Both figures clearly show the large share of the private sector. For primary health care, public and private contributions to services delivered in public facilities are fairly evenly distributed across the income distribution. Richer households spend however, much larger amounts on health care delivered by the private sector. For hospital care all expenditure categories are higher for richer households. Even though the public subsidy is distributed very regressively, the importance of the public transfer diminishes substantially for richer households. For the richest quintile, the public transfer only constitutes 12 percent of total the total expenditures. For households from the poorest quintile the government transfers contribute 30 percent of total expenditure.

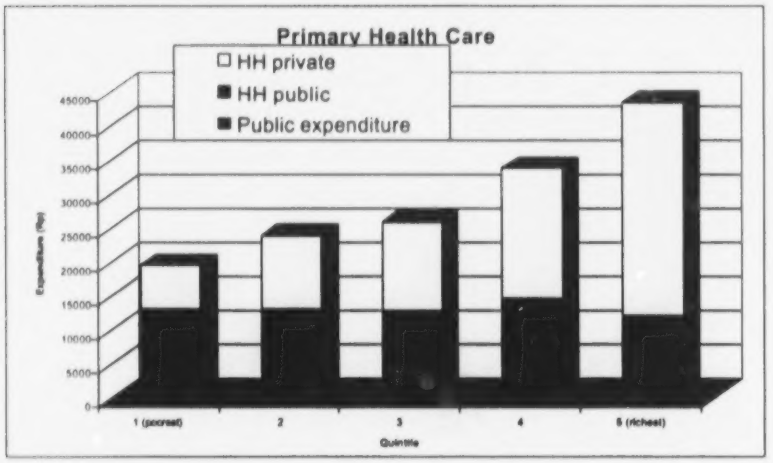

Figure 7 Public and private expenditures on primary health care by consumption quintile in 1998 (Rupiah per capita per year)

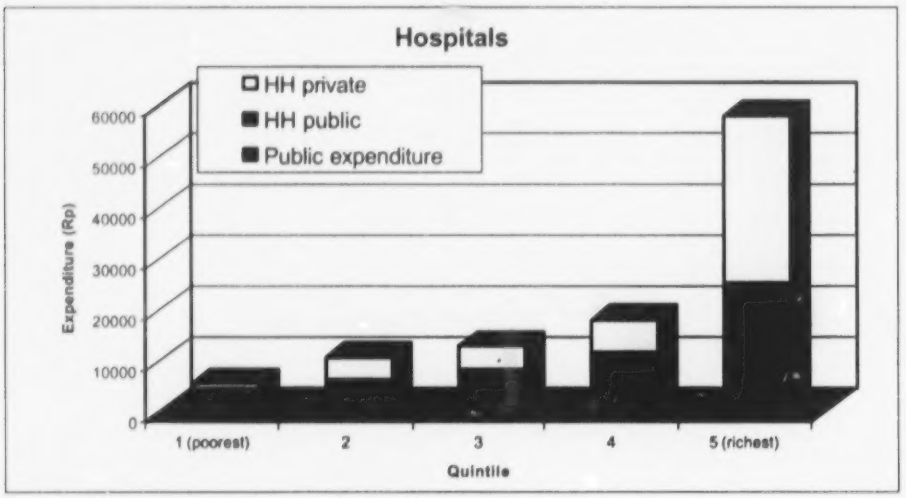

Figure 8 Public and private expenditures on hospitals by consumption quintile in 1998 (Rupiah per capita per year)

6.4 Dynamic Benefit Incidence Analysis

Standard benefit-incidence analysis results are frequently used to make inferences about the distributional impact of public spending reforms. This type of analysis often forms the basis

on which governments decide which policies to pursue and which not. Governments dedicated to combating poverty may decide to increase funding for programs that have proven to benefit the poor. This type of thinking, however, could be wrong. The fact that on average the poor have benefited, say, from public spending on primary health care does not necessarily mean that an increase in spending in this area would also go largely to the poor. The marginal incidence of spending need not equal the average incidence.

The reasons for this discrepancy can be many. The allocation of public spending is typically the outcome of a political process, and the distributional impact of a change in spending will therefore depend on the abilities of different socioeconomic groups to influence that political process. These abilities, in turn, will depend in part on the history of allocations made under the program at the time reforms start. For example, suppose that the nonpoor were able to capture most of the benefits when a program was first introduced but are now satiated on the margin. An expansion of the program might then go disproportionately to the poor, even though an average incidence analysis would suggest that the program is extremely regressive. The opposite is also possible. Suppose that a program is originally very well targeted to the poor because of, say, accurate means testing. As the program expands however, it may become more difficult to carry out the means-testing so that the nonpoor find it easier to participate in the program. The marginal incidence of the program may be quite regressive even though the average incidence results suggest the opposite.

In the remainder of this section we will analyze the dynamics of the benefit incidence in two ways. First, we will compare our results with earlier studies of benefit incidence. By presenting our results in a format comparable to that used in earlier studies, we can observe which groups of the population benefited from the expansion in the health and education system over the past decades. After this discussion of historical trends we will turn to econometric estimates of the dynamic benefit incidence. This analysis is carried out on a series of recent cross-sections of the Susenas household survey.

Historical trends in benefit incidence

Meesok (1984,1987) and van de Walle (1992) analyze benefit incidence of social spending in Indonesia. In this section we reproduce their tables, add the updated figure for 1997, and discuss the historical trends.

In education at the primary level, most of the increases in enrollment stem from the period from 1978 to 1987. In the subsequent decade, the school enrollment at age 7 to 12 has only gone up by an additional 3 percent, reaching almost full enrollment. There is no history of sex discrimination at this level. At ages 13 to 15 there is a history of sex discrimination although by 1997 the differences between boys and girls had almost disappeared. In 1978, the boys/girls difference still stood at 11 percentage points. Boys' increases in enrollment took mostly took place two decades ago. Girls' enrollment steadily increased over both decades. As a result, most of the increases in enrollment in the last decade are a result of girls catching up with boys. At the ages 16-18, which corresponds to senior secondary school, we still find higher enrollment rate for boys in 1997. Boys enrollment is at 50 percent while girls enrollment still stands at 47 percent. There has been little improvement in the past decade. Boys actually experienced a decrease in enrollment of 5 percentage points. Girl's enrollment

increased by only 2 percent point. This surprising finding for boys is not found when we analyze more recent trends (see later discussion), and is therefore questionable. On the whole, looking at a span of two decades, we find substantial improvements in enrollment in the order of about 20 percentage points, with higher increases for girls than for boys.

In 1997, there is very little difference in enrollment rates between Java and the outer islands. The only place where a difference of more than 1 percent point is observed is for boy's enrollment at age 16-18. Java's enrollment is in this case higher. Java has had a late start. In 1978, the enrollment in the outer islands – that is, all Indonesia except Java – was higher throughout. The differences between the two regions disappeared a decade ago at the primary level. For ages 13 to 18, the differences only disappeared in the last decade.

Although the urban/rural gap has narrowed, it has not disappeared to date. Even at the primary level, enrollment is still about 3 percentage points higher in urban areas. At age 13-15 the difference between urban and rural areas is still 8 percentage points, at age 16-18 it increases to 31 percentage points. Looking at changes over the past two decades, however, we find that most of the increase in enrollment has been in the rural areas. Over a period of two decades, the urban rural gap narrowed by 6 percent at the primary level, 10 percent at the junior secondary level, but increased by 3 percent at the senior secondary level. Those living in rural areas have been the primary beneficiaries of infrastructure investments in primary and junior secondary schools whereas the urban areas benefited more from the senior secondary school expansion.

The lower half of Table 15 presents enrolment by quantile. Quantiles have been constructed for each year separately. The changes thus embody both an income effect (people in the same quantile getting richer over time) as well as a supply effect. At the primary level, the poor (lower 30 percent) and middle (middle 30 percent) income groups have been the primary beneficiaries of the increase in enrollment. At the junior secondary level, the increase in enrollment from 2 decades ago was evenly spread across the income groups. In the past decade, the increase has been distributed pro poor. At the senior secondary level we find a reversal of the trend. Over the period from 1978 to 1987, the rich experienced the largest increases in enrollment. In the past decade, the increase has been distributed pro-poor. In 1997, the poor still lag behind the middle income group. The disparity exists at all levels, even at the primary level the poor have not been able to catch up with the middle income group. In 1997, the difference between the middle income group and the poor stands at 3 percentage points at the primary level, 11 percent at the junior secondary level and 14 percent at the senior secondary level.

Table 15 Percentage of children enrolled in different socio economic groups by age group and sex in 1978, 1987 and 1997 (percentages)

		Ages 7-12		Ages 13-15		Ages 16-18	
		Male	Female	Male	Female	Male	Female
All Indonesia	1997	95	96	78	77	50	47
	1987	92	93	77	73	54	45
	1978	84	82	59	47	34	22
Java	1997	96	96	79	77	51	47
	1987	92	93	80	69	50	40
	1978	83	80	57	41	30	19
Outer Islands	1997	94	95	78	77	49	48
	1987	93	93	82	79	59	53
	1978	86	84	62	57	40	26
Urban	1997	98	98	89	87	70	64
	1987	96	95	91	86	76	65
	1978	92	88	81	67	60	40
Rural	1997	94	95	73	70	37	35
	1987	91	92	73	68	44	35
	1978	82	80	54	41	27	16
Per Capita consumption quantile							
Lower 40 percent	1997	93	93	69	68	34	34
	1987	90	90	67	62	33	24
	1978	81	78	48	37	20	9
Middle 30 percent	1997	96	96	80	79	48	48
	1987	93	93	79	75	54	45
	1978	84	82	60	47	30	20
Upper 30 percent	1997	98	98	89	85	68	59
	1987	97	97	92	87	77	64
	1978	91	90	77	59	57	36

Source: 1978 figures from O.A Meesook, 1984, 1987 figures from van de Walle (1992) and 1997 Susenas data tapes

Table 16.Presents information on the trends of the benefit incidence in the health sector. The same degree of comparability as in Table 15, between the earlier studies and the 1997 figure, could not be maintained because of a change in the design of the Susenas questionnaire. In 1997, the reference period for reporting illness was extended from one week to one month. This results in a higher fraction of minor, short duration, illnesses being recorded. For instance, we find that the percentage of individuals reporting sick who do not visit a provider increases from 1987 to 1997. This is easily understood in light of the questionnaire change. However, we have chosen to still report the 1997 figures alongside the figures for the earlier period since they do provide some insight into how the benefit incidence across income groups changed over time. Also one should be aware that the utilization figures reported in Table 16 are conditional upon reporting ill. This is self-reported illness. Over time attitudes about what constitutes an illness could change. A common finding is that those who are richer report ill more often. If this stylized fact carries over to intertemporal comparisons, the increase in welfare will have resulted in a higher proportion of individuals reporting ill while they are healthier. Also this will affect the observed utilization patterns.

For Java, we find that the difference in utilization of health services between the poor and rich is higher in rural areas. We discuss the differences between the poorest and richest 40 percent of the population. From 1978 to 1987, the difference between the poor and rich in the percentage of sick individuals not seeking health care in rural areas increased from 13 to 15 percent point and dropped to 10 percent point in 1997. In urban areas, the poor have caught up steadily. While in 1978 the difference between the poor and rich stood at 46 percent point. In 1997 this had dropped to only 5 percent point. Over time, the puskesmas has taken a more important role in serving the poor. While in 1978 the highest utilization rates were still recorded for the middle income groups, in 1997 the poor were the most frequent users of health center services in both urban and rural areas. Hospital services have always been distributed very pro-rich. There are few changes in this pattern over time. Private doctors are also predominantly used by the wealthier. In rural areas the differences between poor and rich increased over time, possible as a result of the expansion of the public health care system.

In the outer islands, we find little evidence of a catch-up of the poor in the urban areas. The difference between the poorest and richest 40 percent in the percentage of ill not seeking care remains at about 7 percent point. In the rural areas, the patterns are very similar as in Java. The difference between the poor and rich increased from 1978 to 1987 and dropped again to 1978 levels by 1997. The use of the puskesmas has been the highest among the poor and middle income groups in the urban areas. In the rural areas, the rich have the highest utilization of the puskesmas. This pattern has changed little over the past decade. Private doctors have become much less popular in the rural areas over the past decade. Whereas in the urban areas the utilization rates of private doctors dropped in the range of 8 to 18 percent point, those in the rural areas dropped in the range from 15 to 18 percent point. A likely explanation is again the expansion of the public health centers. The pro-rich distribution of services from hospitals is rather constant over time.

Table 16 Treatment of illness by region and per capita expenditure quantile in 1978, 1987 and 1997 (percent of total, based on those reporting illness in the last week for 1978 and 1987 and based on reporting illness in the past month for 1997)

		Urban			Rural		
Last week's illness treated by		Lower	Middle	Upper	Lower	Middle	Upper
Java		40%	20%	40%	40%	20%	40%
Self, family or	(no treat) 1997	49.1	46.6	44.0	51.7	45.9	41.7
No treatment	1987	31.8	26.4	19.6	45.7	37.6	27.6
	1978	58	27	12	53	41	40
Primary health center	1997	23.1	21.0	15.6	23.7	24.3	22.6
(puskesmas &	1987	26.9	26.3	14.4	30.5	31.5	31.0
Auxiliary puskesmas)	1978	19	22	15	17	37	21
Private doctor	1997	14.1	18.6	26.6	6.5	9.7	15.8
	1987	29.3	33.0	46.2	19.0	23.0	32.7
	1978	13	34	58	22	12	29
Hospital	1997	4.0	6.0	9.0	1.3	1.9	3.4
(public & private)	1987	8.21	9.63	16.50	1.11	3.31	3.69
	1978	0	14	5	1	1	7
Private clinic	1997	1.7	1.8	2.4	0.9	0.8	1.2
	1987	2.41	3.43	2.58	1.55	2.31	1.64
	1978	0	0	9	1	2	0
Traditional healer	1997	1.0	0.9	0.8	2.2	2.4	1.9
	1987	1.46	1.19	0.88	2.12	2.31	3.35
	1978	10	3	1	6	7	3
Outer islands							
Self, family or	(no treat) 1997	46.3	42.6	38.9	46.6	43.4	37.8
No treatment	1987	34.7	23.7	27.9	41.2	35.6	28.0
	1978	33	52	26	43	39	33
Primary health center	1997	24.1	23.3	18.0	30.8	31.5	32.7
(puskesmas &	1987	31.2	30.1	14.5	25.5	25.8	28.0
Auxiliary puskesmas)	1978	27	10	22	11	35	23
Private doctor	1997	11.2	15.0	24.9	2.8	4.7	9.0
	1987	19.1	26.5	39.4	17.9	22.3	26.8
	1978	17	27	38	15	9	25
Hospital	1997	8.0	10.5	11.4	2.2	2.7	4.8
(public & private)	1987	9.01	14.90	14.10	3.07	4.56	5.73
	1978	7	5	11	1	2	6
Private clinic	1997	1.8	1.5	2.0	2.4	1.6	1.5
	1987	2.06	2.61	1.89	4.51	3.97	5.15
	1978	0	3	2	8	5	3
Traditional healer	1997	2.5	2.2	1.6	5.0	4.7	4.8
	1987	3.92	2.19	2.23	7.78	7.68	6.37
	1978	13	4	1	22	10	10

Source: 1978 figures Chernikovsky and Meesook (1986), 1987 figures van de Walle (1992) and 1997 Susenas data tapes

Econometric Estimates of the Marginal Incidence of Spending

In Table 15 and Table 16 we examined the incidence of changes in education and health provisioning across two periods of approximately a decade each. Across these time periods there has been considerable change in the scale of government spending on education and health. Scrutinizing simple utilization rates by quantile across SUSENAS surveys of adjacent years in the 1990s provides less evidence of change, and therefore provides little indication of what might be the incidence of further expansion, or contraction, of education and health provisioning beyond current levels

The panel data with which one could attempt to directly estimate the marginal incidence of program spending, are rarely available. Lanjouw and Ravallion (1999) have recently proposed a method to calculate the "marginal odds ratio" of participation based on large-sample cross section data. The marginal odds ratio can be compared to the average odds ratio of participation from the standard incidence analysis. We apply this approach to the combined SUSENAS surveys of 1996-98. The average odds ratio is simply the quintile specific participation rate in a given year t, relative to the participation rate in the population as a whole. Participation rates for a given quintile vary across sub-provincial regions (*kabupatens*, in the case of Indonesia) according to the level of public spending on the program in the province to which each kabupaten belongs. The marginal odds ratio for a quintile can be estimated by regressing the quintile and year specific participation rate in each kabupaten on the province's average participation rate in that year (including all quintiles and all kabupatens). We estimate, separately for each of the five quintiles, the following model:

$$I^{q}_{k,pt} = \alpha + \beta(I_{pt}) + \delta Lit_{p,96} + d96 + d97 + \varepsilon_{t}$$

Where q represents the quintile (i=1,..5), k represents the *kabupaten*, p the province and t the year (for t equalt either to 1996, 1997, or 1998). $I_{p,t}$ is the overall participation rate in province p at time t. In order to capture the possibility that there might be separate factors which influence the province-level stance on the desired progressivity of public spending we include the variable $Lit_{p,96}$ which is represents the province-level adult literacy rate in 1996. Assuming, as we did in the previous sections, that the subsidy rate for a given program is constant across regions and income groups, the marginal odds ratios, represented by $\hat{\beta}$, is interpreted to indicate how an increase in public spending on that program will affect each quintile. [xviii]

For the education analysis the odds ratios are not directly comparable to the average benefit incidence results presented earlier. In the dynamic incidence analysis the enrollment rate is taken as the indicator of interest. It thus ignores the fact that poor families generally have many children (when no economies of scale are assumed). For primary education for instance, the pro-poor average incidence was largely caused by the family composition effect because enrollment is virtually universal. The adjusted average odds ratios presented in the education tables take account of family composition effect by multiplying the odds ratios times the relative share of children in that the appropriate age group for each quintile. In health the results are directly comparable because the contact rates (visits per person) of the whole population are analyzed.

Education

Table 17 Marginal Incidence of Public Spending on Primary Education

Quintile	Net Enrollment (percent)	Average Odds Ratio	Marginal Odds Ratio (s.e.)	Adjusted avg. odds ratio	Adj. marginal odds ratio
1 (poorest)	80.18	0.98	1.06 (0.04)	1.24	1.34
2	83.21	1.02	1.05 (0.04)	1.17	1.21
3	84.41	1.03	1.01 (0.04)	1.04	1.02
4	82.47	1.01	0.97 (0.04)	0.89	0.85
5 (richest)	76.61	0.94	1.02 (0.05)	0.65	0.71
Total	81.64	1.00		1.00	

Source: Authors calculations based on the 1995-1998 SUSENAS household surveys.

The first column in Table 17 provides net enrollment rates in public primary schooling in 1998. These are generally lower than the gross enrollment rates reported in Table 2, but display the same broadly uniform pattern across quintiles. This is reflected in the average odds ratios which lie in a narrow band around 1.0, with the exception of the top quintile where the distance between the participation rate and the overall average is a bit larger. Inferring from these average odds ratios what would be the incidence of a change in public spending on primary schooling would lead to the conclusion that the impact would be broadly distributionally neutral. However, on the basis of the marginal odds estimates in column three, the suggestion is that a change in public spending on primary education would be most strongly felt among the bottom two quintiles. This pattern is consistent with the satiation story described above - that the poor may be the most recent beneficiaries from public spending on public schooling and that a contraction or expansion of public spending would thus be most immediately felt by these households. While primary school enrollment is not far from being universal, the evidence suggests that the poor would be the main beneficiaries from the final expansion of spending needed to achieve full universality.[xix]

Quite a different picture emerges from an analysis of the marginal incidence of public spending on secondary schooling (Table 18). Average participation rates in junior secondary schooling increase sharply with consumption quintiles. However the marginal incidence of a change in program spending would be somewhat less regressive than the average participation rates would suggest. In particular, the evidence suggests that the richest two quintiles, as well as the poorest quintile, would be relatively minor beneficiaries from an increase in public spending on junior secondary education. An important related observation is that one might be mistakenly led to think on the basis of the average odds ratios that a reduction in public spending on junior secondary schooling would not hit the poor hard and would rather hit the relatively well off. The marginal incidence analysis suggests that this view should be moderated.

Table 18 Marginal Incidence of Public Spending on Junior Secondary Education

Quintile	Net Enrollment (percent)	Average Odds Ratio	Marginal Odds Ratio (s.e.)	Adjusted avg. odds ratio	Adj. marginal odds ratio
1 (poorest)	28.15	0.73	0.83 (0.07)	0.84	0.95
2	35.55	0.92	0.98 (0.07)	1.00	1.07
3	40.45	1.04	1.07 (0.07)	1.07	1.10
4	44.61	1.15	0.99 (0.07)	1.08	0.93
5 (richest)	49.45	1.28	0.78 (0.08)	1.02	0.62
Total	38.78	1.00		1.00	

Source: Authors calculations based on the 1995-1998 SUSENAS household surveys.

For senior secondary schooling, the marginal incidence analysis supports the inference from average participation rates that public spending on senior secondary schooling is regressive (Table 19). However, the degree to which this is the case is less marked on the margin than on average.

Table 19 Marginal Incidence of Public Spending on Senior Secondary Education

Quintile	Net Enrollment (percent)	Average Odds Ratio	Marginal Odds Ratio (s.e.)	Adjusted avg. odds ratio	Adj. marginal odds ratio
1 (poorest)	9.84	0.50	0.67 (0.05)	0.50	0.67
2	13.92	0.70	0.90 (0.06)	0.70	0.90
3	18.75	0.95	1.05 (0.07)	0.96	1.06
4	24.32	1.23	1.12 (0.07)	1.23	1.12
5 (richest)	31.95	1.62	0.85 (0.08)	1.61	0.84
Total	19.75	1.00		1.00	

Source: Authors calculations based on the 1995-1998 SUSENAS household surveys.

Overall, the marginal incidence analysis suggests that "early capture" of program spending on education by the nonpoor is generally applicable in the Indonesia case. Eventually, as overall participation rates rise with an increase in the scale of the program, satiation of the nonpoor sets in and the incidence of further expansion becomes increasingly pro-poor.[xx]

Health

As described in sub-section 6.1, using contact rates to examine the incidence of public health spending is somewhat unsatisfactory, because these do not take into account the number of occasions that individuals frequent a health center during the reference period. We base our estimates of the marginal incidence of public health spending by on the number of inpatient and outpatient visits per person per year. As described in section subsection 6.1, we assume that one inpatient day can be counted as 10 outpatient days.[xxi]

Table 20 Marginal Incidence of Public Spending on Public Primary Health

Quintile	Visits per person	Average Odds Ratio	Marginal Odds

	Per year		Ratio (s.e.)
1 (poorest)	1.10	0.96	0.80 (0.08)
2	1.11	0.97	1.01 (0.06)
3	1.21	1.06	1.02 (0.07)
4	1.27	1.11	0.93 (0.09)
5 (richest)	1.02	0.89	0.86 (0.11)
Total	1.14	1.00	

Note: Visits include both inpatient and outpatient visits. One inpatient visit is counted as equal to 10 outpatient visits.
Source: Authors calculations based on the 1997 SUSENAS household survey.

The average incidence of public primary health spending increases with consumption quintiles up to the richest quintile. The inference that one might draw is that an expansion of public spending on primary health care centers would be fairly regressive, benefiting the 4th quintile the most. However, based on our marginal incidence estimates, that conclusion would seem to be mistaken. The marginal odds of participation are highest for the 2nd quintile. It is rather more difficult to account for the marginal incidence pattern observed in Table 20 in terms of an "early capture" story, than was possible with respect to education. In the case of health there are complicating factors associated with, for example, the propensity of the relatively well-off to self-report more illness, and that household spending on health is a far greater component of total spending than is the case with education. [xxii]

Unfortunately, perhaps due to the relatively rare occurrence of hospital visits in the data, marginal incidence estimates for hospital care are not statistically significant.

5. Conclusions

Indonesia is commonly seen as one of the important examples of successful economic development. This is not without reason. Not only has general economic growth been impressive during recent decades, but Indonesia has also managed to ensure that this economic performance has translated into remarkable declines in absolute poverty and substantial improvements in other key dimensions of human development such as education and health. As recently as 1976 two fifths of the Indonesian population lived in poverty, but this had declined to just one in ten persons by the mid 1990s. During this same period primary school enrollment rates rose from about 60% to nearly 100%, and similar improvements were documented for secondary and tertiary education. Life expectancy and infant mortality figures improved dramatically between the 1970s and 1990s.

Yet Indonesia at the beginning of the 21st century faces considerable challenges. The economic and social turmoil which beset the country in the second half of the 1990s, following the financial crisis which hit most Southeast Asian economies, has not yet fully played itself out. The prospects for a return to the growth path of the past remain quite unclear, and there are serious concerns that on the social front critical momentum has been lost. The government's room for maneuver has been sharply curtailed as a result of significant budgetary constraints.

It is also becoming increasingly clear that while poverty reduction and human development at the national level has been impressive, the country's large size and great

geographic heterogeneity masks considerable variation across provinces and sectors. There remain in Indonesia pockets of considerable poverty. Rural areas in many provinces, such as Irian Jaya, East Timor, East Nusa Tengara, North Sulawesi, West Kalimantan, etc., remain afflicted by poverty rates that are double or higher the national poverty rate in rural areas. While poverty in urban areas is typically lower than in rural areas, provinces also vary markedly in urban poverty levels. The general impression of great heterogeneity is echoed in education achievements and health outcomes. A clear challenge for the future is to address these spatial differences and ensure that all Indonesians are represented in the country's social achievements. The wide regional disparities also imply that each region needs to adopt policies in line with their stage of development, something that is difficult to define solely at the central level. Greater regional autonomy in setting social policies seems a fruitful direction to take. The central coordinating role will remain important in defining a regional development strategy, ensuring coherence of the different policies, and sharing knowledge.

In this paper we have focussed on education and health in Indonesia, and their interrelationship with poverty, with the aim of distilling lessons and delineating important priorities for policy makers wishing to shore up progress achieved to date and to confront the challenges which remain. Drawing on multiple rounds of Indonesia's SUSENAS household surveys for the mid and late 1990s, as well as drawing on other data sources, we documented the reversal in the rate of decline in poverty and slowdown in the improvements in the social sectors as a result of the economic crisis. We have shown that enrollment rates, particularly in junior secondary and higher education levels, are far from universal, and that health outcomes, compared to other countries in the Southeast Asia region, leave much to be desired. We have also illustrated that within the country there exists considerable regional variation.

While education and health each constitute key elements of social welfare with their own *intrinsic* value and importance, there are also myriad linkages between these disparate outcomes such that they have an *instrumental* influence on each other. Measuring the link between, say, education and income, or health and income, is often very difficult, because the available data are rarely sufficient to demonstrate the precise causal role that these factors are playing. Drawing on a small number of studies carried out in Indonesia in recent years which can be judged to have adequately addressed the econometric hurdles posed by this type of analysis, we have documented the important contribution of education to income. Economic rates of return to education in Indonesia are found to be quite high, compared to other countries, but that with generalized expansion of education outcomes these are declining over time. Empirical estimates also exist to suggest that the expansion of physical school infrastructure is associated with higher wage rates. While analysis of the relationship between health and education is particularly prey to measurement problems, there exists some evidence for Indonesia that good health also contributes to higher earnings. Of course, not only do education and health influence earnings but they also mutually determine each other. Evidence from studies in Indonesia suggest that there is a strong impact of education, particularly mother's education, on the nutritional status of children, and of parents' education on the education of children.

The intrinsic and instrumental importance of education and health to social welfare naturally prompt close government interest in seeing educational achievements expand and

health outcomes improve. Such government interest often translates into intervention on the grounds that education and health-care investments produce considerable externalities in terms of incomes and growth, as well as additional indirect effects on themselves. Moreover, it is often argued that government intervention in education and health is warranted on equity grounds – the poor are unable to provide themselves with the socially desired levels of education and health. This latter contention finds ample support in the Indonesian context where several careful studies document that an increase in the price of education (say a removal of subsidized school fees) will result in a decline in the quantity of education purchased. As found elsewhere, price elasticities of demand for education are significant and negative. In health, too, the evidence suggests that a rise in the cost of health care will result in lower health care utilization. Initial evidence from a carefully designed experiment carried out in Indonesia indicates that the decline in health demand for a given rise in the price of health care would be particularly significant among the poor.

The case for government intervention in the education and health sectors in Indonesia is thus quite strong. Not surprisingly, when the institutional structure of education and health care provision is examined, the public sector is found to dominate. Public expenditure on education, with the public sector dominating at all education levels, represented nearly 3% of GDP in 1997, or 14% of the government budget. The bulk of spending is on primary education, but secondary and tertiary education are also important. We find marked disparities in the supply of public health and education services across provinces. Despite the large public presence in the education sector, counterpart spending by households on education nearly matches that of the government. In health, the government spends about 0.5% of GDP per year on health, approximately 3.5% of its budget. Here too, households are required to contribute, and in fact typically spend more than twice the amount spent by the government on health. The degree of government subsidy in education thus exceeds considerably the degree of subsidy of health. Whether this balance is appropriate is an important question which the paper studies further.

Ensuring access to health and education for the poor thus will be a key element of a anti poverty policy. Under stressed government budgets this implies that price subsidies cannot remain universal but will need to be better targeted. Targeted price subsidies have been used in the social safety net program which was instituted as a response to the recent economic crisis for primary health care and junior secondary education. It is too early to evaluate their success at this time. An alternative policy to adopt would be a regionally focused one. In areas where we know there is concentration of poverty, government provision of health care and education can be more subsidized than in areas where is less poverty. In the latter areas, which will often be the more urbanized ones, the private sector can take on a more important role. By reducing subsidies for government facilities in these areas competition will be fostered. Especially in health, the private sector has been already becoming an increasingly important provider of services, and it is in this sector that competition is most likely to be successful.

Do the poor benefit from the considerable government presence in the education and health sectors which currently prevails? This question is important in light of the equity argument for government intervention. In the face of the considerably tightened budgetary

circumstances of the present, government spending on education and health which does not reach the poor represents a formidable opportunity cost. One of the major goals this paper has been to study the distributional incidence of public spending in education and health in Indonesia. In this paper we have opted to deflate household consumption for spatial cost of living variation on the basis of a price index which has been selected to reflect not only differences in food prices, but which also mirrors the distribution of welfare defined in terms of a range of non-monetary indicators of wellbeing.

Using the traditional benefit-incidence analysis, we find that public spending in primary education is reasonably pro-poor. While gross enrollment rates among the poorest quintiles are not markedly higher than average, the large number of children in these quintiles ensures that the per capita transfer share to the bottom two quintiles is slightly higher than for the other three quintiles. In the case of junior secondary schooling, the per capita transfer share is highest among the 3rd and 4th quintiles. For senior secondary schooling the clear beneficiaries have been the top two quintiles. In the health sector, we examine public spending on primary health care and on hospitals. The benefit incidence analysis indicates a slight pro-poor orientation of primary health care spending. The opposite is clearly the case for public spending on hospitals.

We have emphasized in this paper that many of the conclusions from standard benefit incidence analysis may be premature because of an important implicit assumption which such analysis tends to make, and which requires probing. Conclusions from benefit incidence analysis may not be robust to the introduction of some allowance for economies of scale in consumption. An important feature of the analysis here has been to undertake sensitivity analysis, to gauge how robust the conclusions described above are to the introduction of economies of scale in consumption.

Our evidence suggests that education spending has perhaps been rather less pro-poor (in the case of primary education) and more regressive (in the case of secondary schooling) than one typically is led to believe, and that primary health spending has possibly been more progressive than is usually supposed. Sensitivity analysis indicates that the distribution of public spending on schooling (primary, junior secondary and senior secondary) becomes more regressive once allowances are made for economies of scale in consumption. If one believes that there are significant economies of scale in consumption, then public spending on even primary schooling no longer seems pro-poor. And the regressiveness of spending on secondary schooling becomes more accentuated. In the case of health the opposite occurs. With allowances for economies of scale, public subsidies in the health sector become more pro-poor. A likely explanation is that health care is particularly important to the elderly. As economies of scale are allowed for, the bottom quintiles are less exclusively made up of large households (i.e. households with many children) and more of the small households in which the elderly often live are included among the poor.

That the poor could potentially benefit from an expansion of subsidized primary health care is further confirmed when we compare the overall share of spending on health by the public sector compared to households themselves. As we have noted above, even in publicly provided health care centers, households are obliged to incur considerable expenses. At the aggregate level, households in Indonesia spend many times over what the government spends

on health. At all income levels there is plenty of scope for substitution of household contributions with government transfers. It is clear that the poor are particularly badly placed to incur the necessary private expenditures to obtain the healthcare treatment that they need. On the other hand, the small share of public expenditures in total health expenditures for the rich indicates that reducing those expenditures will make little difference to them. The case is most striking for government hospitals. The benefit incidence of government expenditures for this category is very pro-rich while the share of government expenditures as a percent of total is very small. There seems no compelling reason to maintain these universal subsidies in the present form.

In education the government bears the largest burden of the expenditures. Here there is little scope for substitution and as a result additional spending should be aimed at increasing enrollment and/or enhancing quality. Private schools cannot be ignored in such a policy since a substantial fraction of the poorest children are enrolled in primary private religious schools, often of dubious quality.

To recap so far, our analysis suggests that the poor have generally benefited from government subsidies in primary health care. However, the evidence on household spending suggests that the subsidies are only a small fraction of total costs – so that the poor are still left to pay a significant amount. In the case of education, the evidence seems to suggest that the poor have not been the principal beneficiaries of public spending. Moreover, the actual government transfers in education are orders of magnitude higher than for health. It would seem that a case could be made for recommending an increase in government spending on health, possibly financed by a reduction in education subsidies at the post-basic level.

However, we have shown in this paper that before such a recommendation is offered it is necessary to consider the distributional impact of *changes* in government spending, not simply the current average incidence of government spending. We started by taking a long view, and asking what has been the incidence of government education and health spending between 1978, 1987 and 1997. The evidence indicates that the poor benefited considerably from the expansion of government spending on primary education throughout the period. The expansion of junior secondary and senior secondary education became increasingly pro-poor in the decade between 1987 and 1997. This picture suggests that the nonpoor have been able to enjoy "early capture" of education subsidies but that over time expansion of education spending goes disproportionately to the poor. The expansion also allowed girls to catch up with boys virtually eliminating the sex bias at present.

On the health side, the evidence is rather more difficult to compare over this long period. However the tentative picture is also consistent with a marginal incidence of spending on primary health which is pro-poor; while the non-poor may be the early beneficiaries of this spending, expansion benefits the poor rather more (and contraction would hurt the poor disproportionately). In the case of hospitals, the evidence is stronger that the poor are not major beneficiaries throughout the period.

Does the general impression of the marginal incidence of spending across decades provide a good indication of the incidence of changes in government spending at a given point during the late 1990s? While multiple rounds of SUSENAS data are available for the

1990s, there is little evidence of change in the scale of government spending during this period, and thus little change in the incidence of this spending at a national level from one year to the next. We employ recent econometric techniques which exploit the spatial variation in the incidence of spending across districts and provinces to probe the above question. The results supported the suggestion from the historical analysis that the marginal incidence of primary education spending is pro-poor. This conclusion is somewhat weaker in the case of junior secondary and secondary schooling, but in all cases the evidence suggests the marginal incidence is less regressive than what one might think by just looking at average incidence figures. The overall impression is that changes in government spending on education would not leave the poor unaffected. If the changes concern primary education, the poor would be particularly hard hit (positively in the event of an expansion, negatively in the event of a reduction).

Our econometric approach to estimating the incidence of health spending suggests, once again consistent with the historical analysis, that changes in government spending on public primary health would not leave the poor unaffected. The evidence here, too, is that increases in public spending on primary health care centers would benefit the poor considerably.

To summarize, our dynamic analysis of the incidence of government spending on education has yielded the important insight that the choices facing the Indonesian government on the allocation of spending across education sectors is less neat than one might have thought at first glance. Static benefit incidence analysis might have suggested that further expansion of primary and possibly junior secondary schooling, could be financed by a reduction of subsidies for secondary schooling, with only minor impact on the poor. However, the marginal incidence analysis suggests that removal of secondary subsidies would also affect the poor. We have suggested that in all education sectors, the non-poor are generally among the first to benefit from government spending, but that as this spending has continued and expanded the poor have come to benefit from these subsidies as well. Removing subsidies from one education sub-sector to finance further subsidies in another sub-sector is likely to produce both winners and losers among the poor. The results also imply that a policy aimed at improving the quality of the existing providers (for example by providing better textbooks) will be more pro rich than a policy that aims at expanding the supply of education (by building new schools). For the latter the marginal benefit incidence is the appropriate result to look at while for the former the average incidence is relevant.

Our analysis has also suggested that while there seems to be an unambiguous case for further expansion of primary health care spending in poor areas by the Indonesian government, it is not at all obvious that this should be financed, even only in part, by a reduction in education spending. Once again, the marginal incidence analysis which has shown that the poor are beneficiaries of government spending on primary but also junior secondary and secondary education, indicates that shifting resources out of education (at least secondary levels and lower) would create losers among the poor, although it also seems clear that that poor would benefit from lower health care costs. A more compelling direction to take, if it truly proves impossible to increase health spending out of general government revenues, would be to shift health spending out of hospitals and toward primary health centers.

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Table A 1 Consolidated budget for education from 1984 to 1997

5.1.1 Education	1984/ 1985	1985/ 1986	1986/ 1987	1987/ 1988	1988/ 1989	1989/ 1990	1990/ 1991	1991/ 1992	1992/ 1993	1993/ 1994	1994/ 1995	1995/ 1996	1996/ 1997	1997/ 1998
Total consolidated education expenditure (in billion Rupiah)	2,914	4,010	3,724	4,041	4,445	4,927	5,845	6,730	8,325	9,542	10,885	12,702	14,649	14,852
Education expenditure/GDP (perc)	3.2	4.1	3.6	3.2	3.0	2.7	2.8	2.7	3.0	2.9	2.9	2.8	2.8	2.9
Education expenditure/government expenditure (perc)	15.0	17.6	17.0	15.0	13.5	12.9	11.8	12.9	14.3	14.8	15.1	15.4	15.7	14.1
Education expenditure primary education/ Education expenditure (perc)	58.2	52.7	55.8	48.1	49.4	43.4	51.6	50.1	50.2		52.6	52.0	52.1	
Education expenditure junior secondary education/ Education expenditure (perc)	14.4	17.3	13.2	12.7	12.2	13.3	13.3	13.9	13.6		16.5	17.0	17.7	
Education expenditure senior secondary education/ Education expenditure (perc)	11.6	12.9	11.3	15.8	15.9	17.1	13.0	13.8	13.1		13.8	12.8	12.8	
Education expenditure higher education/ Education expenditure (perc)	9.2	11.0	13.3	16.4	16.0	18.1	13.4	12.5	13.8		10.4	11.4	11.4	
Routine education expenditure/Education expenditure (perc)	60.1	61.4	71.1	72.4	74.6	71.5	73.2	69.6	69.4	66.6	69.6	70.3	69.2	71.2
Development education expenditure/Education expenditure (perc)	39.9	38.6	28.9	27.6	25.4	28.5	26.8	30.4	30.6	33.4	30.4	29.7	30.8	28.8

Notes: Shares of primary, secondary and Higher do not add up to 100 because not government expenditures that could not be attributed to these categories are not included

Figures present realized expenditures upto 1992/1993. After that allocated expenditures are reported.

Source: World Bank (1998)

Table A 2 Consolidated government budget for health from 1994 to 1998 by type of care and source of funding (billion Rupiah, current prices)

	1994/95				1995/96				1996/97				1997/98				1998/99			
SOURCE	Hosp	PCare	Others	Total	Hosp	PCare	Others	Total	Hosp	PCare	Others	Total	Hosp	PCare	Others	Total	Hosp	PCare	Others	Total
Routine	**482.1**	**1172.8**	**416.3**	**2071.2**	**567.9**	**1316.9**	**556.9**	**2441.7**	**695.3**	**1625.7**	**578.2**	**2899.2**	**718.5**	**2038.1**	**761.7**	**3518.3**	**1530.3**	**2957.6**	**706.9**	**5194.8**
DIK-Non Salary /a	90.4	16.5	48.1	155.0	102.9	23.5	62.3	188.7	115.1	26.2	69.9	211.2	133.5	34.2	89.8	257.5	35.0	67.0	194.3	296.3
DIK-Salary /a	124.9	87	215.9	427.8	144.5	125.1	306	575.6	179	158.5	256.2	593.7	237.3	314.3	397.1	948.7	277.8	320.7	235.2	833.7
DIK-S /a	61.4	0.5	15.9	77.8	75.2	0.9	23.8	99.9	69.2	0.5	28.9	98.6	0.7	72.4	27.3	100.4	63	3.6	42.4	109
SBBO /b	12.2			12.2	32.9			32.9	31.6			31.6	24.8			24.8	73			73
SDO /c		443		443		532.6		532.6		624.7		624.7		738.8		738.8		871.7		871.7
Development budget																				
DIP /d	111.2	191.8	69.6	372.6	113.9	218.8	72.1	404.8	130.2	261.6	71.7	463.5	200.2	289.2	84.7	574.1	331.6	566	76.9	974.5
OPRS /e	50.8			50.8	52.7			52.7	50.9			50.9								0/g
BLN /f	31.2	92.7	14.8	138.7	45.8	73	14.7	133.5	119.3	136.3	34.5	290.1	122	129.1	15.1	266.2	749.9	407.7	33.1	1191
INPRES /h		341.3	52	393.3		343	78	42		417.9	117	534.9		460.1	147.7	607.8		720.9	125	845.9

/a Operation maintenance, salaries, medicines consumables, replacement equipment and expandable supplies, /b non salary expenditures (excl drugs) in provincial and district hospitals /c personal component covering salaries of regional staff /d allocated to regions for all public hospitals for equipment procurement, hospital construction, training and other hospital investments /e building renovation equipment maintenance and additional consumables or medicines for all public hospitals /f foreign aid /g there is aid-funding in the amount of Rp.667.9 bn which has not been included here because this amount is not recorded at Ministry of Health. Rp. 218.5 bn is in the form of raw material for drugs from Japan, Rp. 449.4 is emergency grant for subsidizing foreign exchange rate in importing drugs. /h grant finance for health center construction and subsidy for some operating costs.

	1994/1995	1995/1996	1996/1997	1997/1998	1998/1999
Total consolidated health expenditure (in billion Rupiah)	2071.2	2441.7	2899.2	3518.3	5194.8
Heath expenditure/GDP (perc)	0.54	0.54	0.55	0.50	0.67
Health expenditure/government expenditure (perc)	2.9	3.0	3.1	3.5	3.5
Primary health care expenditure/ total health expenditure (perc)	56.6	73.3	157.3	102.0	53.9
Hospital expenditure/total health expenditure (perc)	23.3	206.5	31.6	371.9	23.3
Non attribut able expenditure/total health expenditure (perc)	20.1	364.7	43.1	236.5	22.8

Source: Calculated from data provided by department of health and ministry of finance. Budget data are updated from Saadah Lieberman and Juwono (1999). The reported figures exclude provincial and district budgets.

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Table A 3 Private and public spending on primary education (Rupiah per capita per year)

Primary			
Quintile	Public expenditure	HH public	HH private
1 (poorest)	47,898	9,220	1,346
2	45,324	10,366	1,374
3	40,004	10,617	1,587
4	34,375	11,257	2,552
5 (richest)	25,270	12,494	6,605
80			

Table A 4 Private and public spending on junior secondary education (Rupiah per capita per year)

Junior Secondary			
Quintile	Public expenditure	HH public	HH private
1 (poorest)	10,446	5,298	2,822
2	13,235	7,798	3,639
3	14,072	9,048	4,698
4	14,299	10,513	5,891
5 (richest)	13,472	14,073	8,993

Table A 5 Private and public spending on senior secondary education (Rupiah per capita per year)

Senior Secondary			
Quintile	Public expenditure	HH public	HH private
1 (poorest)	4505	2639	3065
2	6708	4344	5156
3	8849	6509	7840
4	11336	9190	11357
5 (richest)	15987	16500	18525

Table A 6 Private and public spending on primary health care (Rupiah per capita per year)

Primary Health Care			
Quintile	Public expenditure	HH public	HH private
1 (poorest)	10,786	2392	6415
2	10,734	2514	10602
3	10,192	2744	13021
4	10,553	4211	19000
5 (richest)	9,098	3148	31173

Table A 7 Private and public spending on hospitals (Rupiah per capita per year)

	Hospitals		
Quintile	Public expenditure	HH public	HH private
1 (poorest)	1,825	2911	1140
2	2,014	4514	4496
3	3,656	4952	4479
4	3,445	8386	6521
5 (richest)	7,167	18381	32616

Table A 8: Marginal Incidence of Public Spending on Primary Education

Quintile	Marginal Odds θ=1	Marginal Odds θ=0.8	Marginal Odds θ=0.6
1 (poorest)	1.06	1.08	1.07
2	1.05	1.05	1.05
3	1.01	1.00	0.99
4	0.97	0.98	1.01
5 (richest)	1.02	1.02	1.02

Source: Authors calculations based on the 1995-1998 SUSENAS household surveys.

Table A 9: Marginal Incidence of Public Spending on Junior Secondary Education

Quintile	Marginal Odds θ=1	Marginal Odds θ=0.8	Marginal Odds θ=0.6
1 (poorest)	0.83	0.79	0.78
2	0.98	0.98	0.98
3	1.07	1.06	1.02
4	0.99	0.98	1.07
5 (richest)	0.78	0.84	0.80

Source: Authors calculations based on the 1995-1998 SUSENAS household surveys.

Table A 10: Marginal Incidence of Public Spending on Senior Secondary Education

Quintile	Marginal Odds θ=1	Marginal Odds θ=0.8	Marginal Odds θ=0.6
1 (poorest)	0.67	0.68	0.71
2	0.90	0.85	0.85
3	1.05	0.98	0.95
4	1.12	1.11	1.09
5 (richest)	0.85	0.87	0.86

Source: Authors calculations based on the 1995-1998 SUSENAS household surveys.

Table A 11: Marginal Incidence of Public Spending on Primary Health Centers

Quintile	Marginal Odds θ=1	Marginal Odds θ=0.8	Marginal Odds θ=0.6
1 (poorest)	0.80	0.76	0.84
2	1.01	1.09	1.02
3	1.02	0.93	0.94
4	0.93	0.91	0.97
5 (richest)	0.86	0.86	0.80

Source: Authors calculations based on the 1995-1998 SUSENAS household surveys.

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[i] (1) Vrije Universiteit Amsterdam, (2) World Bank. We are grateful to Jenny Lanjouw, Christian Morisson, Dominique van de Walle, and participants at two workshops held at the OECD, Paris, in the spring of 1999 and 2000, for useful comments and suggestions. The views in this paper are those of the authors and should not be taken to reflect the views of the World Bank or any of its affiliates. Melanie Juwono provided indispensable inputs and assistance.

[ii] Public primary health care includes health centers, subsidiary health centers, Polindes and Posyandu. Private primary health care represents private doctors, clinics and paramedical practitioners (Petugas).

[iii] From web site bureau of Statistics Indonesia- http://www.bps.go.id

[iv] A major difference between the official poverty lines, based on the "Food energy" method, and the "Cost of Basic Needs" lines which have been developed by Bidani and Ravallion (1993) is that the former allow poverty lines to differ across provinces as a consequence of varying food prices as well as a varying food basket. The latter approach holds the food basket constant and allows only price differences to drive differences in the poverty lines. An additional difference in the two approaches is in the source of the price information used to value the food basket(s) (for further details see Chesher, 1998, and Bidani and Ravallion, 1993).

[v] We construct two measures of "real" consumption based, respectively, on the price indices arising out of the official poverty lines, and the alternative poverty lines. Real per capita consumption is defined as $C^* = C\frac{PL}{PL^R}$ where C is per capita consumption, PL^R is the poverty line for region R and PL is the national poverty line. The national poverty line is the population weighted mean of the regional poverty lines.

[vi] Child mortality is calculated using the indirect method based on the number children born and number of children that died recorded in Susenas 1996. The child mortality rate is calculates using a UN developed program QFIVE. The method is described in United Nations (1990).

[vii] Malnutrition is defined using the ratio of a child's weight, measured in kilograms, to the child's age, measured in months. Weight for age measurements are compared to international standards, using the reference growth curves developed by the U.S. National Center for Health Statistics (NCHS) and recommended for international use by the World Health Organization (WHO). Those who have a weight for age which falls in the lowest 5th percentile of the US distribution are considered malnourished. This indicator is based on the Susenas 1998.

[viii] For further details on the FGT class of poverty measures, see Foster, Greer and Thorbecke (1984)

[ix] Drèze and Sen (1995) provide an insightful discussion of the intrinsic and instrumental roles of education and health in the context of Indian development.

[x] These private enrollment percentages differ from those derived from SUSENAS (used throughout the paper) due to the fact that the former is derived from an establishment survey (GOI's annual survey of schools). It is expected that household surveys yield different data from establishment surveys at any one point in time. The two data series however show similar trends over time in enrollment, public/private participation etc.

[xi] For more information on Indonesia's education system, see World Bank 1998.

[xii] The Core of the 1998 SUSENAS collects education expenditure using a single question. Expanding this figure to the national level yields to a household education expenditure of 8,280 billion Rupiah.

[xiii] Gross enrolment rates differ from *net* rates in that in the latter only children of a given age group who are enrolled in, say, primary school are related to the total number of children in that age group. In the case of gross enrolment rates, persons in other age groups who happen to be enrolled in primary school are also included in the numerator which is compared to the denominator of all children in a given age group.

[xiv] As a result of a change in the questionnaire design we cannot calculate the contact rate for inpatient services in the past month in 1998. The contact rate reported in Table 9 includes both in and outpatient services. We therefore report figures for 1997.

[xv] According to Module of the 1995 SUSENAS, the average out of pocket payments for a outpatient visit to a private provider were 11,063 Rupiah while the average out of pocket payments for an inpatient day in a private hospital was 114,474 Rupiah.

[xvi] See Coulter et al, 1988, and Deaton and Paxson, 1998, for further discussion. At present no widely accepted method exists with which to estimate such economies of scale in consumption (see Lanjouw and Ravallion, 1995, and Deaton and Paxson, 1998, for further discussion). However, it is increasingly recognised that the implicit assumption of zero economies of scale is not tenable.

[xvii] Assumptions about economies of scale in consumption are just one of many that underlie any distributional analysis based on quantitative data. However, they have received relatively little attention in the literature to date. Moreover, there are grounds for being particularly alert to the issue in the context of benefit incidence analysis, as opposed to in poverty studies more generally. This is because many public transfers (such as education and health subsidies, but also public pensions) implicitly target individuals from households which vary in size in a systematic way. For example, pensioners and the infirm often tend to reside in small households, while children typically reside in large households. As a result, the choice of how benefit incidence analysis is conducted can, in principle, have a direct bearing on the kind of conclusions which result.

[xviii] Because kabupaten and quintile specific participation rates are implicitly included when calculating the province's overall mean participation rate (on the right hand side), OLS will give a biased estimate of the marginal odds of participation. Because we have data for multiple years we are able to calculate participation rates for 1995 through 1998. We instrument the average participation for a given province in year *t* with the participation rate for *t-1*. For each program separately, we estimate five two-stage least squares models, one for each quintile, of kabupaten specific participation rates on province overall participation rates. There are 27 provinces and a total of 306 kabupatens in the dataset. We have checked to see whether employing *leave out mean* province level participation rates as instruments (as in Lanjouw and Ravallion, 1999) leads to different results. The broad findings are the same, but this latter instrument performs less satisfactorily due to some individual *kabupatens* representing a sizeable fraction of the total province-level population.

[xix] Although the individual marginal odds estimates are statistically significant, the standard errors are large enough to prevent many of the comparisons of marginal odds ratios *across* quintiles from being statistically significant. The evidence based on the econometric analysis described here should thus be interpreted cautiously, and is best viewed as a complement to the longer-term historical analysis reported earlier.

[xx] We checked whether our assessments of the marginal incidence of public spending change when we allow for economies of scale in consumption. While we saw that on average public spending in education becomes more regressive as we allow for economies of scale in consumption, the marginal incidence of these programs proves to be remarkably stable. Appendix tables A.08&A.10 provide details.

[xxi] Our estimation for the marginal incidence of health spending are based on the 1995-1997 surveys only. In addition, the regression models excludes the undernutrition variable due to

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[xxii] Sensitivity analysis on the basis of economies of scale in consumption to support the notion that increasing spending on primary health is pro-poor for moderate economies of scale, but that this then declines again as more extreme economies of scale are assumed (see Table A.11).